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THE DIAGNOSIS AND TREATMENT OF THE IRON-DEFICIENCY ANEMIAS

FRANK H. BETHELL, M.D.
S. MILTON GOLDHAMER, M.D.
RAPHAEL ISAACS, M.D.
AND
CYRUS C. STURGIS, M.D.
ANN ARBOR, MICH.

A lack of sufficient iron available for the requirements of hemoglobin formation leads to anemia of the hypochromic or "secondary" type. Such an anemia may properly be attributed to iron deficiency, even though this element is supplied in usual quantities in the diet.

The most frequent cause of iron-deficiency anemia is continued or recurrent excessive loss of blood. The replacement of hemoglobin lost by hemorrhage depletes and finally exhausts the body's reserves of iron.[1] In such cases the dietary iron is insufficient for the increased demand, and anemia results.

A "secondary" anemia, occurring most often in middle-aged women, and frequently not associated with excessive loss of blood, has recently attracted a great deal of attention. Its commonly accepted designation is idiopathic hypochromic anemia.[2] Achlorhydria or marked hypochlorhydria is an invariable accompaniment of this condition. The anemia is presumably due to defective absorption of dietary iron, dependent on the lack of acid in the stomach. However, in the normal individual the conservation of iron is so efficient and in the adult the requirement of food iron so small that, even in the presence of achlorhydria, anemia rarely develops unless there is an additional factor, such as blood loss or pregnancy.[3] It appears that, in some women with achlorhydria, normal menstruation results in sufficient loss of blood to cause anemia.

Anemia due solely to a lack of iron in the food occurs most commonly in infants and young children.[4] It may develop in elderly persons living on grossly abnormal diets, although in these cases vitamin deficiency also probably plays an important rôle.[5]

The term "iron-deficiency anemia" is based on etiologic considerations with their therapeutic implication and in no sense denotes a constant clinical entity. The symptoms and physical signs associated with this condition are those of any anemia and comprise fatigability, weakness, faintness, dizziness, palpitation, dyspnea on exertion, pallor, tachycardia, hypotension and dependent edema. Some patients with achlorhydria complain of difficulty in swallowing (Plummer-Vinson syndrome), caused apparently by esophageal spasm. Enlargement of the spleen is sometimes present.[6] In a considerable number the clinical picture bears a certain resemblance to that of pernicious anemia. There may be recurrent glossitis with subsequent atrophy of the papillae of the tongue. Digestive disorders consisting of anorexia, distention, flatulence and alternate constipation and diarrhea are not uncommon. Some patients complain of numbness and tingling of the extremities, although objective neurologic changes have not been reported.

Of thirty-three patients having hypochromic anemia with achlorhydria studied at the Simpson Memorial Institute, five mentioned dysphagia as one of their most troublesome symptoms; thirteen patients complained of periodic soreness of the tongue and mouth; six had paresthesia of the extremities.

The sex, age and duration of anemia of twenty-seven patients with acid gastric secretion and of thirty-three patients with anacidity studied consecutively are shown in charts 1 and 2. Of the latter

From the Thomas Henry Simpson Memorial Institute for Medical Research, University of Michigan.

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6. McCann and Dye.[2]

group all but two were females; their average age was 42.9 years, and 85 per cent were known to have been anemic for more than three years. In contrast, the group secreting hydrochloric acid showed a slight predominance of males, their average age was 33.3 years, and 78 per cent had been anemic for less than three years.

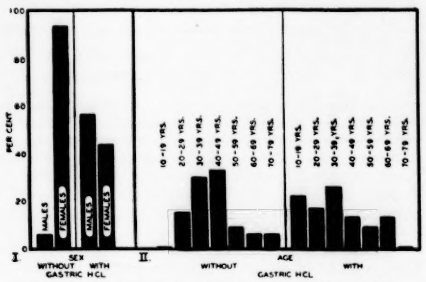

Chart 1.—Sex and age of patients with iron-deficiency anemia.

In conjunction with the routine blood count, the estimation of erythrocyte size is of great importance in the study of iron-deficiency anemia. The measurement of cell diameters, on stained blood films, according to the method of Price-Jones, makes possible the determination of the mean diameter and gives information regarding the percentage distribution of cell sizes. The use of the hematocrit in conjunction with the erythrocyte count affords a more delicate method of measuring cell size, as it deals with volume rather than with diameter, but it fails to differentiate variations of corpuscular volume in any given blood sample. It is a characteristic of the form of anemia under consideration that together with the decrease in corpuscular hemoglobin there is, but to a relatively less degree, a diminution of cell size. Thus the color index, mean erythrocyte diameter, volume, hemoglobin and hemoglobin concentration are all lowered.[7] When there has been recent and relatively acute hemorrhage, these values are less characteristic and the red blood cells may vary but little from normal. A group of cases in which these determinations were made is shown in table 1.

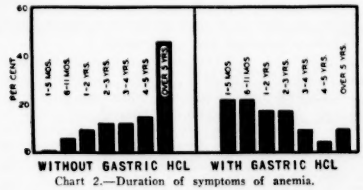

Chart 2.—Duration of symptoms of anemia.

The blood examination of patients with iron deficiency reveals a secondary type of anemia of all grades of severity. In contrast to the low hemoglobin, the red blood cell count, in long-standing cases without recent acute hemorrhage, is usually within or near normal limits if the hemoglobin is above 7 Gm. per hundred cubic centimeters. With lower hemoglobin values there is generally a progressive decline in the number of erythrocytes per cubic millimeter. In our series of cases the lowest blood count was found in a woman, aged 36, with achlorhydria and without a history of an abnormal loss of blood. The red blood cell count was 1,920,000 per cubic millimeter, the hemoglobin 1.83 Gm. per hundred cubic centimeters (11 per cent). After five weeks of treatment with iron the erythrocyte level was 4,420,000 per cubic millimeter; the hemoglobin 8.13 Gm. (49 per cent) (chart 5). The range of the color index in these cases without recent hemorrhage is about 0.4 to 0.7. When there has been continued loss of blood the depression of the erythrocytes is more commensurate with that of the hemoglobin, and the color index and mean erythrocyte volume are greater. In the latter type of case the first effects of treatment may result in a lowering of the color index, as the red blood cells regenerate at a more rapid rate than the hemoglobin. In one of our patients, a woman, aged 39, with a normal degree of gastric acidity, anemia developed as the result of bleeding hemorrhoids. The duration of the illness was at least one year. On admission the red blood cell count was 2,230,000 per cubic millimeter, hemoglobin 5.48 Gm. (33 per cent), color index 0.74. After three weeks of treatment the erythrocytes numbered 4,450,000 per cubic millimeter, hemoglobin value 9.13 Gm. (55 per cent), color index 0.62 (chart 6).

TABLE 1.—*Diagnostic Blood Studies in Representative Cases of Iron-Deficiency Anemia* *

Case	Red Blood Cells per Cu. Mm.	Hemoglobin Per Cent	Hemoglobin Gm.	Color Index†	Mean Erythrocyte Diameter, Microns	Volume per Cent (Hematocrit)	Mean Erythrocyte Volume, Cubic Microns	Mean Erythrocyte Hemoglobin‡	Mean Erythrocyte Hemoglobin Concentration, %
1	2,770,000	48	7.97	0.87	7.22	27.4	99	28.8	29.1
2	2,380,000	40	6.64	0.91	6.88	20.0	84	27.9	33.2
3	2,060,000	12	1.99	0.34	6.03	8.5	41	9.7	23.3
4	2,990,000	36	5.98	0.60	6.54	23.0	77	20.0	26.0
5	3,800,000	43	7.14	0.57	6.72	22.9	60	18.8	31.0
6	4,060,000	56	9.30	0.69	6.87	31.1	77	22.9	29.9
7	4,220,000	38	6.31	0.45	6.64	25.1	59	14.9	25.1
8	4,410,000	49	8.13	0.56	7.16	33.2	75	18.4	24.5
9	4,940,000	43	7.14	0.44	6.89	26.0	53	14.5	27.3
10	4,960,000	68	11.29	0.69	7.21	40.3	81	22.8	28.0

* Cases 1 and 2 presented severe continued bleeding shortly before the counts were made. The others showed long-standing anemia, for the most part with achlorhydria.
† Uncorrected.
‡ Expressed in micromicrograms.

The estimation of the response to treatment of persons with iron-deficiency anemia depends on the clinical improvement and on characteristic changes in the blood picture. The earliest effect is commonly an increase in the percentage and concentration of reticulated red blood cells. As was pointed out by Minot and Heath,[8] there is an inverse relationship between both the erythrocyte count and the hemoglobin value at the beginning

7. These phenomena have been discussed by:
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of treatment and the height of the reticulocyte percentage response. However, the peak of the response in a given case of iron-deficiency anemia is much less predictable than in one of pernicious anemia, probably because the etiologic basis of the former type may vary so widely. Reticulocyte counts, on patients with secondary anemia treated with iron, are of clinical value only in that they indicate early in the course of therapy normoblasts and macronormoblasts,[9] but it is probable that the obstacle to maturation operates at all stages of the developing erythrocyte. The accumulation of normoblasts may be the result of a general retardation of development of cells, poorly equipped from the outset for their functional rôle in the organism. The availability of additional iron probably accelerates erythrocyte maturation from the beginning of the

TABLE 2.—*Fourteen Patients with Anemia and Normal Gastric Acidity Treated with Ferrum Reductum or Ferric Ammonium Citrate*

					1 Week		2 Weeks		3 Weeks		4 Weeks		5 Weeks		6 Weeks		7 Weeks		8 Weeks				
Case	Age	Initial Red Blood Count	Initial Hemoglobin, per Cent	Initial Hemoglobin, Gm.	Hemoglobin, Gm. Total	Hemoglobin, Gm. Increase	Hemoglobin, Gm. Total	Hemoglobin, Gm. Increase	Hemoglobin, Gm. Total	Hemoglobin, Gm. Increase	Hemoglobin, Gm. Total	Hemoglobin, Gm. Increase	Hemoglobin, Gm. Total	Hemoglobin, Gm. Increase	Hemoglobin, Gm. Total	Hemoglobin, Gm. Increase	Hemoglobin, Gm. Total	Hemoglobin, Gm. Increase	Hemoglobin, Gm. Total	Hemoglobin, Gm. Increase	Final Red Blood Count	Final Hemoglobin, per Cent	Weeks
1	56	2.78	47	7.80	8.96	1.16	9.30	1.50	12.45	4.65	.....	....	....	....	....	....	....	....	....	....	3.63	75	3
3	34	4.23	58	9.63	10.79	1.16	12.62	2.99	14.11	4.48	.....	....	....	....	....	....	....	....	....	....	4.59	85	3
4	18	2.57	50	8.30	8.80	0.50	12.12	3.72	.....	....	.....	....	....	....	....	....	....	....	....	....	4.40	73	2
5	24	3.27	39	6.37	....	....	8.03	1.66	.....	....	11.35	4.98	....	....	....	....	....	....	14.11	7.74	4.64	85	8
19	32	1.18	17	2.82	4.65	1.83	6.31	3.49	7.47	4.65	.....	....	....	....	....	....	....	....	....	....	3.01	45	3
21	37	2.13	38	6.31	7.30	0.99	7.97	1.66	12.47	2.16	.....	....	....	....	....	....	....	....	....	....	3.45	53	3
27	39	2.23	33	5.48	6.14	0.66	6.97	1.49	9.13	3.65	.....	....	11.95	6.47	12.95	7.47	....	....	....	....	4.32	78	6
29	34	2.67	31	5.10	7.30	2.20	10.79	5.69	.....	....	11.95	6.85	....	....	....	....	....	....	....	....	5.11	72	4
30	14	3.51	37	6.14	8.47	2.33	10.29	4.15	11.29	5.15	11.79	5.65	....	....	....	....	13.78	7.64	....	....	4.34	83	7
37	20	2.69	36	5.98	7.14	1.16	8.80	2.82	10.29	4.31	10.96	4.98	....	....	12.28	6.30	....	....	....	....	4.32	74	6
38	39	3.94	34	5.64	5.64	0.0	7.14	1.50	8.30	2.66	.....	....	10.79	5.15	....	....	....	....	....	....	4.75	65	5
39	29	3.16	31	5.10	....	....	....	....	.....	....	8.63	3.53	....	....	11.95	6.85	....	....	....	....	4.47	72	6
43	14	3.62	50	8.30	9.30	1.00	10.96	2.66	12.45	4.15	13.78	5.48	....	....	....	....	....	....	....	....	4.19	83	4
44	68	2.78	41	6.81	6.97	0.16	8.63	1.82	10.29	3.48	.....	....	....	....	....	....	....	....	....	....	4.86	62	3
Av.	32.6	2.91	38.7	6.41	7.62	1.10	9.23	2.70	10.42	3.93	11.41	5.24	11.37	5.81	12.36	6.87	13.78	7.64	14.11	7.74			

TABLE 3.—*Twenty-Eight Patients with Anemia and Achlorhydria Treated with Ferrum Reductum or Ferric Ammonium Citrate*

					1 Week		2 Weeks		3 Weeks		4 Weeks		5 Weeks		6 Weeks		7 Weeks		8 Weeks				
Case	Age	Initial Red Blood Count	Initial Hemoglobin, per Cent	Initial Hemoglobin, Gm.	Hemoglobin, Gm. Total	Hemoglobin, Gm. Increase	Hemoglobin, Gm. Total	Hemoglobin, Gm. Increase	Hemoglobin, Gm. Total	Hemoglobin, Gm. Increase	Hemoglobin, Gm. Total	Hemoglobin, Gm. Increase	Hemoglobin, Gm. Total	Hemoglobin, Gm. Increase	Hemoglobin, Gm. Total	Hemoglobin, Gm. Increase	Hemoglobin, Gm. Total	Hemoglobin, Gm. Increase	Hemoglobin, Gm. Total	Hemoglobin, Gm. Increase	Final Red Blood Count	Final Hemoglobin, per Cent	Weeks
1	45	4.00	42	6.97	6.81	—0.16	6.97	0	8.30	1.33	9.46	2.49	10.46	3.49	....	....	....	....	....	....	4.94	63	5
6	28	3.25	38	6.31	6.31	0	7.47	1.16	....	....	....	....	....	....	....	....	....	....	....	....	3.45	45	2
7	39	3.87	37	6.14	7.14	1.00	7.64	1.50	....	....	....	....	....	....	....	....	....	....	....	....	5.11	66	2
8	40	4.55	47	7.80	8.63	0.83	8.63	0.83	....	....	....	....	....	....	....	....	....	....	....	....	5.25	52	2
9	43	5.25	52	8.63	9.96	1.33	9.69	1.06	10.46	1.83	11.12	2.49	11.62	2.99	12.12	3.49	13.78	5.15	....	....	4.45	83	7
10	35	4.23	32	5.48	5.81	0.33	....	....	....	....	....	....	....	....	13.29	7.48	....	....	....	....	5.66	68	6
11	44	3.17	51	8.46	8.80	0.44	9.13	0.67	9.46	1.00	10.33	1.87	10.79	2.33	....	....	....	....	12.28	3.82	4.14	74	8
12	71	2.29	25	4.15	....	....	5.98	1.83	....	....	....	....	....	....	11.62	7.47	....	....	....	....	4.14	70	6
13	32	3.46	28	4.65	3.82	—0.83	7.30	2.65	....	....	....	....	....	....	....	....	....	....	....	....	3.92	44	2
14	36	1.92	11	1.83	2.66	0.83	4.48	2.65	4.65	2.82	....	....	8.03	6.20	....	....	....	....	....	....	4.42	49	5
15	42	4.66	45	7.47	8.80	1.33	9.46	1.99	....	....	....	....	....	....	....	....	13.61	6.14	....	....	5.22	82	8
16	29	3.51	38	4.65	6.14	1.49	7.80	3.15	8.80	4.15	....	....	....	....	....	....	....	....	13.45	8.80	4.58	81	8
17	47	3.16	38	4.65	5.15	0.50	6.37	1.72	7.47	2.82	....	....	10.29	5.64	....	....	12.78	8.13	....	....	4.36	77	7
18	39	4.16	47	7.80	8.80	1.00	8.96	1.16	9.96	2.16	....	....	....	....	....	....	....	....	....	....	4.50	60	3
20	50	3.52	36	5.98	5.98	0	6.64	0.66	....	....	....	....	10.29	4.31	....	....	....	....	....	....	4.76	62	5
22	30	4.32	38	6.31	6.81	0.50	....	....	....	....	....	....	9.69	3.38	....	....	....	....	11.79	5.48	4.82	71	8
25	46	4.22	34	5.64	7.80	2.16	9.30	3.66	....	....	....	....	13.94	8.30	....	....	....	....	....	....	5.73	84	5
26	32	3.10	34	5.64	7.30	1.66	9.30	3.66	....	....	13.29	7.65	....	....	....	....	....	....	....	....	3.87	68	4
28	48	3.72	40	6.64	....	....	....	....	9.30	2.66	....	....	....	....	....	....	....	....	....	....	4.79	56	3
31	41	2.79	25	4.15	4.71	0.56	5.81	1.66	....	....	7.97	3.82	....	....	....	....	....	....	....	....	3.79	48	4
32	43	4.87	38	6.31	....	....	....	....	10.62	4.31	....	....	....	....	13.01	7.70	....	....	....	....	4.64	79	6
33	41	4.24	31	5.15	5.31	0.16	....	....	....	....	10.96	5.81	....	....	....	....	....	....	....	....	5.63	66	4
34	48	4.94	38	6.31	6.81	0.50	8.30	1.99	....	....	.:.	....	....	....	....	....	....	....	14.28	7.97	5.58	86	8
35	60	4.18	38	6.31	8.80	2.49	....	....	....	....	11.62	5.31	....	....	....	....	....	....	13.78	7.47	4.41	83	8
36	24	5.33	42	6.97	....	....	....	....	9.63	2.66	....	....	11.35	4.38	....	....	13.28	6.31	....	....	4.62	80	7
40	42	4.62	36	5.98	6.64	0.66	....	....	....	....	9.13	3.15	....	....	....	....	....	....	....	....	4.52	55	4
41	66	3.50	32	5.31	....	....	....	....	....	....	8.46	3.15	....	....	....	....	....	....	....	....	4.64	51	4
42	20	3.89	47	7.80	7.14	—0.66	....	....	....	....	....	....	....	....	13.78	5.58	....	....	....	....	5.10	83	6
Av.	41.5	3.88	36.5	6.05	6.79	0.70	7.74	1.77	8.87	2.57	10.26	3.97	10.72	4.56	12.76	6.33	13.36	6.43	13.16	6.71			

whether or not the anemia will be benefited by iron or, in the case of a preparation of unknown value, they may yield information regarding its potency.

Reticulocytosis in iron-deficiency anemia is explained by the apparent stimulatory effect of this element on erythrocyte maturation. In that iron is lacking, a defect of blood formation may be considered to exist, even though the erythrocyte level in the circulating blood is not appreciably depressed. Bone marrow studies in this type of anemia reveal a large number of process, the partially developed corpuscles being forced into the circulation by the pressure of antecedent activity. This hypothesis is supported by the clinical observation that, during the early period of the reticulocyte response, although there may be a gain in erythrocytes and hemoglobin depending on the influx of new cells, there is commonly little or no change in the

9. Dameshek:[3] Doan, C. A.: Current Views on the Origin and Maturation of the Cells of the Blood, J. Lab. & Clin. Med. **17:** 887 (June) 1932. Isaacs, Raphael: Mechanism of the Production of Anemia, J. A. M. A. **101:** 2077 (Dec. 23) 1933.

color index or mean corpuscular hemoglobin. On the other hand, the appearance of immature and abnormal red blood cells in the circulation may, in part, result from the rapid "cleaning out" of the extramedullary centers of hematopoiesis commonly accompanying severe anemia.[10]

Observations on so limited a series of cases as is presented here does not justify detailed conclusions regarding the rate of increase of hemoglobin and red blood cells throughout the course of iron therapy. The response of forty-two patients, treated orally with either 4 Gm. of ferric ammonium citrate or 1.5 Gm. of ferrum reductum daily, is shown in tables 2 and 3. The cases have been separated into those with and those without hydrochloric acid in the gastric contents. Histamine stimulation was used during each gastric analysis and, for the present purpose, no distinction between degrees of acidity is made. All members of both groups had anemia with low color index. Cases of acute hemorrhage, continued bleeding during treatment, obvious infection, malignancy, nephritis and cirrhosis of the liver are not included. Most of the recorded observations were made while the patients were in the hospital and partaking of the usual house diet, from which liver and kidneys were excluded.

Erythrocyte counts were made with apparatus certified by the U. S. Bureau of Standards, and hemoglobin estimations were done by a modified Sahli technic, the standard used being equivalent to 16.6 Gm. of hemoglobin at 100 per cent, as determined by the oxygen capacity method. Included in the tables are the patients' ages, initial red blood cell counts in millions per cubic millimeter, initial hemoglobin values in terms of both percentage and grams per hundred cubic centimeters, and available weekly determinations of the hemoglobin with the consequent total gain in hemoglobin, the two latter values being expressed in grams per hundred cubic centimeters. The observations cover a maximum of eight weeks following the institution of iron therapy, but the greater number of patients were followed for a shorter time. Erythrocyte counts, except those taken at the first and last recorded

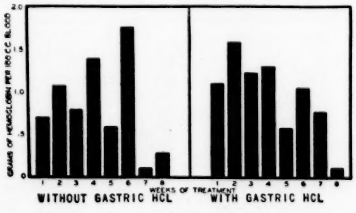

Chart 3.—Weekly average hemoglobin increase during treatment with iron preparations.

observation, are not shown, because an effective correlation of the data involved is not possible without further subdivision of the groups, a procedure which the limited number of cases renders unpractical. The patients were selected for the present report primarily on the basis of their hemoglobin deficiency, and they comprise a very wide range of erythrocyte values. On charts 4, 5 and 6 are recorded, in association with other data, successive red blood cell counts made on individual patients, which illustrate the characteristic types of erythrocyte response to iron in those forms of anemia amenable to its use.

By subtracting from the average total hemoglobin gain registered each week the average total gain at the preceding week, values are obtained that represent the average increase in hemoglobin, expressed in grams per hundred cubic centimeters, during each of the first eight weeks of iron therapy. These values are plotted

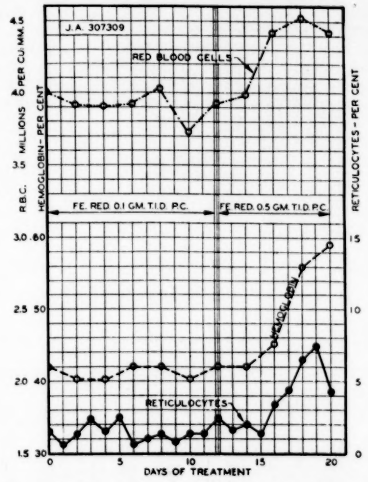

Chart 4.—Comparative effect of 0.3 Gm. and of 1.5 Gm. of ferrum reductum given daily in three parts after meals to a patient with achlorhydria.

in the form of histograms (chart 3). It should be noted that the rate of increase of hemoglobin during the first three weeks of treatment is appreciably greater in those patients who secrete hydrochloric acid into the stomach than in those with achlorhydria. Recovery from anemia is attained sooner by the members of the former group, but the ultimate results of treatment with iron are equally satisfactory in the two groups. The values for weekly gain, taken in conjunction with the weekly average hemoglobin totals, compare favorably with the results reported from the use of iron and copper,[11] iron and "secondary anemia liver extract," [12] iron and intramuscular liver extract,[13] and iron and desiccated stomach.[14] The apparent value of whole liver with supplementary iron in the treatment of anemia associated with malnutrition and vitamin deficiency [15] can probably be attributed to its protein and high content of vitamins A and B rather than to any specific hematopoietic substance.[16]

10. Brannan, D.: Extramedullary Hematopoiesis in Anemias, Bull. Johns Hopkins Hosp. **41:** 104 (Aug.) 1927.

11. Mills, E. S.: The Treatment of Idiopathic (Hypochromic) Anemia with Iron and Copper, Canad. M. A. J. **22:** 175 (Feb.) 1930.

12. Cheney, G., and Niemand, F.: The Treatment of Secondary Anemia with "Secondary Anemia Liver Extract" and Iron, Am. J. M. Sc. **184:** 314 (Sept.) 1932.

13. Murphy, W. P.: Treatment of Secondary Anemia with Special Reference to the Use of Liver Extract Intramuscularly, Arch. Int. Med. **51:** 656 (May) 1933.

14. Sharp, E. A.: Secondary Anemia: A Preliminary Report on Stomach, J. Michigan State M. Soc. **30:** 927 (Dec.) 1931.

15. Keefer, C. S., and Yang, C.: The Treatment of Secondary Anemia: A Study of the Results in 126 Cases, Arch. Int. Med. **48:** 537 (Oct.) 1931.

16. Farrar, G. E.: Nutritional Requirements for Blood Regeneration, personal communication to the authors.

With reference to the value in iron-deficiency anemia of supplying erythrocyte "stroma building substances," it is of course conceivable that in some patients with achlorhydria and simple anemia there may be a diminished production of the intrinsic factor shown by Castle [17] to be essential for erythrocyte maturation. Such patients might be expected to benefit from the administration of liver, liver extract or desiccated stomach in conjunction with adequate amounts of iron. However, the fact that there is usually little or no increase in the color index during the most active period of blood regeneration in response to iron, and that the color index rarely attains unity before the count becomes normal, indicates that, in the great majority of patients with iron-deficiency anemia, there is no dearth of stroma building material.

Evaluation of therapeutic iron preparations will not be attempted in the present report, since in the treatment of iron-deficiency anemia our aim has been to achieve maximum absorption and utilization of iron by administering the metal in excess quantities.[18] Iron in a soluble salt is apparently more efficiently utilized than the same quantity as ferrum reductum, but the latter will produce equally good results if given in adequate dosage and possesses the advantages of small bulk and comparative freedom from irritative effects on the alimentary tract. In our experience 4 Gm. of ferric ammonium citrate, representing about 0.8 Gm. of iron, or 1.5 Gm. of ferrum reductum, is an optimum amount for daily administration, and in these dosages the two forms of iron are quite comparable in their effects. Continued iron medication is usually necessary in order to prevent recurrence of anemia in patients with achlorhydria. Apparently there is less tendency for relapse to occur after the menopause.

That relatively large quantities of iron are required by the patient with achlorhydria is illustrated by the blood studies depicted in chart 4. J. A., a woman, aged 45, received 0.1 Gm. of ferrum reductum three times a day for fourteen days. There was no definite reticulocyte response or increase in the red blood cells or hemoglobin. When the dosage was augmented to 0.5 Gm. three times a day a prompt effect was noted. That this increase was not due to a delayed response to the preceding small dosage of iron is indicated by the behavior of the reticulocytes, which followed a characteristic course during the second period of treatment. It is probable that the time of administration of iron and the division of the daily dosage are factors almost equal in importance to the total amount given to patients with achlorhydria. Mettier and Minot [19] have shown that iron is absorbed more rapidly from an acid than from an alkaline medium.[20] Our patients received their iron immediately after each meal, when the gastric contents presumably were at the greatest degree of acidity. Of physiologic interest is the observation, recorded in chart 5, that a daily quantity of iron, ordinarily ineffective in the presence of achlorhydria when given in the usual three doses, is markedly efficacious when administered in relatively minute amounts hourly throughout the day. The patient in question, M. D., a woman, aged 36, received 0.03 Gm. of ferrum reductum ten times a day, the same

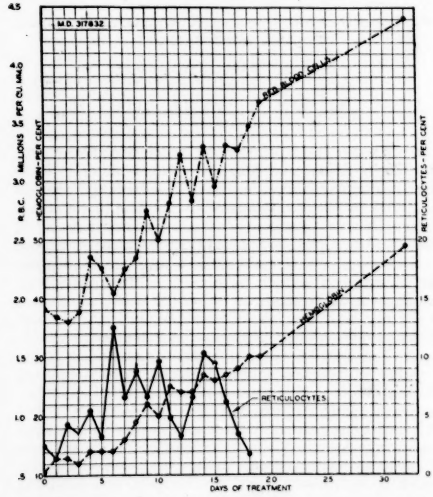

Chart 5.—Effect of 0.3 Gm. of purified ferrum reductum given daily in ten doses hourly of 0.03 Gm. to a patient with achlorhydria.

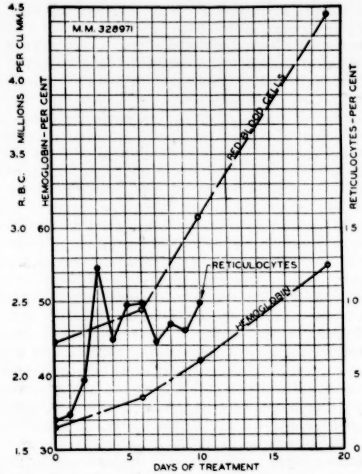

Chart 6.—Effect of 0.3 Gm. of purified ferrum reductum given daily in three parts after meals to a patient with normal gastric acidity.

17. Castle, W. B.; Townsend, W. C., and Heath, C. W.: Observations on Etiologic Relationship of Achylia Gastrica to Pernicious Anemia; Nature of Reaction Between Normal Human Gastric Juice and Beef Muscle Leading to Clinical Improvement and Increased Blood Formation Similar to Effect of Liver Feeding, Am. J. M. Sc. **180:** 305 (Sept.) 1930.

18. Meulengracht, E.: Large Doses of Iron in the Different Kinds of Anemia in a Medical Department, Acta med. Scandinav. **58:** 594, 1923. Goodall, A.: Treatment of Anemia; Chlorosis and Secondary Anemia, Lancet **1:** 1216 (June 19) 1926. Schulten, H.: Zur Behandlung hypochromer Anämien mit maximalen Eisendosen, München. med. Wchnschr. **77:** 355 (Feb. 28) 1930.

19. Mettier, S. R., and Minot, G. R.: The Effect of Iron on Blood Formation as Influenced by Changing the Acidity of the Gastroduodenal Contents in Certain Cases of Anemia, Am. J. M. Sc. **181:** 25 (Jan.) 1931.

20. Riecker, H. H.: The Relation of Available Iron to Acid and Alkaline Diets, Am. J. Clin. Investigation **10:** 657 (Aug.) 1931.

total amount as that first given to J. A., which in her case failed to induce a response. A definite reticulocyte response and a sustained rise of erythrocytes and hemoglobin were obtained. It would seem that a larger proportion of the iron ingested is absorbed when the metal is allowed to pass through the alimentary tract in an almost continuous stream than when administered in more concentrated doses. That such considerations are not valid for patients with normal gastric secretion is indicated by the response of the blood in the case of a woman, M. M., aged 39, who received 0.3 Gm. of ferrum reductum given daily in three parts. Here the presence of hydrochloric acid has made possible a more efficient utilization of the iron than occurred in the two previously described cases of anacidity (chart 6).

In order to exclude, so far as could be done, the possible effect of copper on blood regeneration in iron-deficiency anemia, a number of our patients were treated with minimal effective amounts of ferrum reductum, especially prepared and purified so as to contain less than 0.001 mg. of copper per gram of iron. Furthermore, for at least one week prior to treatment and throughout the course of iron therapy such patients received a diet supplying approximately only 0.5 mg. of copper daily. The usual diet supplies about 4 mg. of copper daily. The two patients M. D. and M. M., whose blood records are depicted in charts 5 and 6, were treated in this manner. The low copper intake apparently made no difference in the responses of these patients to iron. While such observations do not take into account the possible influence of copper already stored in the body, they suggest that in the treatment of the usual case of iron-deficiency anemia, whether or not associated with achlorhydria, no advantage is gained by including copper in therapeutic preparations of iron.

CONCLUSIONS

Iron-deficiency anemia results from a lack of sufficient available iron for normal hemoglobin formation. Such a lack may be induced by (1) depletion of the iron reserves from continued blood loss, (2) inadequate intake of food iron and (3) improper absorption of the element from the alimentary tract and, as a rare possibility, (4) from inability to utilize available iron.

In women with achlorhydria, anemia may develop as the result of the physiologic loss of blood. In such cases a "conditioned deficiency" dependent on the lack of hydrochloric acid may be said to exist.

The clinical features presented by patients with iron deficiency anemia are not specific. They include the effects of lack of hemoglobin supplemented by the manifestations of whatever associated condition may be present. By contrast, the blood in such patients possesses certain definite characteristics that are of diagnostic value. The relative decrease of hemoglobin exceeds that of the erythrocytes, and the average size of the red corpuscles is reduced, although proportionately to a less extent than the diminution of hemoglobin. Consequently, the color index and the mean erythrocyte diameter, volume, hemoglobin and hemoglobin concentration are below normal.

The effects of treatment with simple iron preparations of forty-two cases of iron-deficiency anemia, twenty-eight with achlorhydria, are shown in tabulated form. These results compare favorably with those reported by others employing combinations of iron with other substances in the treatment of the same type of anemia.

Relatively large amounts of ingested iron are required for satisfactory clinical and hematologic improvement. Ferrum reductum, 1.5 Gm. daily, or ferric ammonium citrate, 4 Gm. daily, administered in three divided doses after meals, in our experience, is therapeutically optimal. Following the institution of treatment a latent period, during which no change in the peripheral blood picture occurs, is attributed to the time required for maturation by the primitive erythrocytes in the bone marrow. In general, the blood of patients with acid gastric secretion responds more promptly to iron medication, and a smaller dosage of the element is required than is the case of those with achlorhydria. In both groups the erythrocyte and hemoglobin values are usually restored to normal after from six to eight weeks of therapy. Patients with achlorhydria often require continued treatment with iron in order to prevent recurrence of anemia.

Administration of highly purified ferrum reductum in conjunction with a "low copper" diet did not detract from the efficacy of the iron, as evidenced by the rate of hemoglobin formation.

ASSAY OF COMMERCIAL EXTRACTS OF LIVER FOR PARENTERAL USE IN PERNICIOUS ANEMIA

METHOD OF SUCCESSIVE RETICULOCYTE RESPONSES IN THE SAME PATIENT

WILLIAM DAMESHEK, M.D.
AND
WILLIAM B. CASTLE, M.D.
BOSTON

Much water has run under the bridge since the report in 1926 by Minot and Murphy [1] that a hitherto fatal disease, pernicious anemia, could be effectively treated by the use of large amounts of liver. The preparation of an effective fraction or extract of liver was soon announced by Cohn, Minot and their associates.[2] Since 1927, various commercial extracts have been available for clinical use. These have been in the form of a simple aqueous concentrate or as the material soluble in 70 per cent but insoluble in 95 per cent alcohol (fraction G of Cohn), prepared as a powder or in water-alcohol solution. Lately this fraction has been prepared in aqueous solution suitable for parenteral administration. The organs of a variety of animals have been used: the cow, the sheep, the pig, the horse, and even the codfish. After the discovery that pernicious anemia was a disorder usually dependent on defective gastric secretion,[3] Sturgis and Isaacs,[4] in collaboration with Sharp,[5] used the desiccated and defatted

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From the Division of Research, Boston State Hospital; the Medical Service and Department of Pathology, Beth Israel Hospital; the Thorndike Memorial Laboratory, Second and Fourth Medical Services (Harvard), of the Boston City Hospital; and the Department of Medicine of the Harvard University Medical School.

1. Minot, G. R., and Murphy, W. P.: Treatment of Pernicious Anemia by a Special Diet, J. A. M. A. **87**: 470 (Aug. 14) 1926.

2. Cohn, E. J.; Minot, G. R.; Fulton, J. F.; Ulrichs, H. F.; Sargent, F. C.; Weare, J. H., and Murphy, W. P.: The Nature of the Material in Liver Effective in Pernicious Anemia, J. Biol. Chem. **74**: lxix (July) 1927.

3. Castle, W. B.: Observations in the Etiologic Relationship of Achylia Gastrica to Pernicious Anemia: I. The Effect of the Administration to Patients with Pernicious Anemia of the Contents of the Normal Human Stomach Recovered After Ingestion of Beef Muscle, Am. J. M. Sc. **178**: 748 (Dec.) 1929.

4. Sturgis, C. C., and Isaacs, Raphael: Desiccated Stomach in the Treatment of Pernicious Anemia, J. A. M. A. **93**: 747 (Sept. 7) 1929.

5. Sharp, E. A.: An Antianemic Factor in Desiccated Stomach, J. A. M. A. **93**: 749 (Sept. 7) 1929.

gastric tissue of swine in its treatment. As another by-product of the experimental observations on the hematopoietic effects of the interaction of beef muscle with normal gastric juice has come "extralin," which is prepared by the interaction of liver or liver extract with fresh hog gastric tissue.[6]

The clinician faced with a patient having pernicious anemia has lately been in the rather pleasant position of choosing one of the several effective extracts rather than of attempting to decide on a medication that might be of possible value. Recently the use of the parenteral extracts has been in the ascendency. Gänsslen [7] in 1930 was the first to prepare an extract suitable for intramuscular use. Castle and Taylor [8] in 1931 and Strauss, Taylor and Castle [9] in the same year reported the successful preparation of extracts suitable respectively for intravenous and intramuscular use from an already available extract for oral use (fraction G of Cohn et al.). It was soon found that material given by the parenteral route was at least thirty times as effective as when given by mouth, since the same results could often be accomplished by giving parenterally the material derived from 10 to 20 Gm. as from 300 to 600 Gm. of liver given orally. Various investigators, particularly Murphy,[10] soon pointed out that the parenteral method was more regular in its effectiveness, less expensive to the patient, certainly easier to tolerate than continued oral administration, and more amenable to careful supervision of the patient by the physician.

The first parenteral extracts proposed contained a relatively small amount of extract (20 cc. of solution contained the material derived from 100 Gm. of liver), but attempts at concentration were soon made. Then certain companies produced extracts in which as much of the material as possible derived from 100 Gm. of liver was dissolved in 5 cc. of liquid, later in only 3 cc. of fluid.[11] Another company produced an extract of equine liver suitable for subcutaneous or intramuscular usage which contained material derived from 100 Gm. of liver in 10 cc. of fluid.[12] There has been much vagueness in the phraseology descriptive of the various products, so that it has frequently been most difficult for the practicing physician to choose the most efficient and economical source of active material. The probability, furthermore, that some loss of potency would take place during preparation and especially during concentration has not been commented on in the literature regarding these products.

Even in the 1934 edition of New and Nonofficial Remedies no information regarding these questions is available. Therein, several liver preparations for parenteral use (and for that matter for oral use) are described as being derived from and also representing the antianemic potency of the original amount of liver used in their preparation! Since it is known that the fraction used as the starting point in the preparation of most of the parenteral products has already sustained a loss of 35 per cent of the original potency of the whole liver, one or the other of the foregoing statements must be in error. Judging from the observations of Cohn [13] and of West,[14] even more serious would be the losses of potency likely to occur in attempts at further purification or concentration of the material. Fortunately the effectiveness of active material given by injection is so much greater than when given by mouth that a relatively inefficient process of preparation would still give reasonably good clinical results with the large dosage usually advocated. Since little if any attempt has been made to determine the smallest dose of the different extracts necessary to produce a maximal hematopoietic response, it was considered desirable to attempt a comparative assay of various commercial (parenteral) extracts of liver on that basis.

METHODS AND MATERIAL

The various extracts of liver on the market must at present be tested on the human subject, since no suitable animal method for standardization has yet been found. The usual method is to test a batch of extract by observing its effect, when given in fairly large dosage, in increasing the numbers of reticulocytes and red blood cells in a group of patients with pernicious anemia. Average results are then computed. However, the scarcity and variability of suitable patients renders such observations less satisfactory than a comparison of effective materials in the same patient. Furthermore, unless submaximal dosage is used, losses of potency will not be detected unless the amount of active principle is reduced so greatly that a maximal reaction is not obtained. For these reasons, the method of investigation described here depends on the use in individual patients of comparative ten to fourteen day periods, during each of which the daily injection of a uniform suboptimal dose of a given product is carried out and the reticulocyte (and erythrocyte) responses are studied.

Suboptimal doses must naturally be used in a comparative study in the same patient, since, if optimal or maximal doses are used, a maximal response will usually be obtained, thus making subsequent responses impossible. Castle and his associates [9] had previously shown that a maximal reticulocyte response could be obtained following the daily intramuscular injection of as much of the amount of Liver Extract-Lilly, N. N. R., derived from 10 Gm. of liver, as could be dissolved in 2 cc. of water. Our comparative observations were therefore usually based on the daily injection of the amount of extract in various products derived from 5 Gm. of liver. When a suboptimal dose of liver extract is given, a shower of reticulocytes roughly proportional to the amount of extract given is obtained. The reticulocyte "peak" is definitely lower than when a maximal dosage is given and may not be followed by a significant rise in the red blood cell count. However, the door is left open for further testing.

When a uniform daily suboptimal dosage of liver extract has been given, the reticulocyte response is either completely concluded in from ten to twelve days or is definitely on its downward course. This allows for the observation of a possible second response of reticulocytes when another more potent extract or a larger dosage of the same extract is given in a similar fashion. Not only has the principle of the "double" response, in determining whether a given form of therapy is maximal, been utilized in macrocytic anemia

6. Fouts, P. J., and Zerfas, L. G.: Liver-Gastric Tissue Preparations in the Treatment of Pernicious Anemia, J. A. M. A. **101:** 188 (July 15) 1933.
7. Gänsslen, M.: Ein hochwirksamer, injizierbarer Leberextrakt, Klin. Wchnschr. **9:** 2099 (Nov. 8) 1930.
8. Castle, W. B., and Taylor, F. H. L.: Intravenous Use of Extract of Liver, J. A. M. A. **96:** 1198 (April 11) 1931.
9. Strauss, M. B.; Taylor, F. H. L., and Castle, W. B.: Intramuscular Use of Liver Extract, J. A. M. A. **97:** 313 (Aug. 1) 1931.
10. Murphy, W. P.: The Advantages of Intramuscular Injections of a Solution of Liver Extract in the Treatment of Pernicious Anemia, Am. J. M. Sc. **186:** 361 (Sept.) 1933.
11. Murphy, W. P.: The Parenteral Use of Liver Extract in Pernicious Anemia, J. A. M. A. **98:** 1051 (March 26) 1932.
12. Meyer, A. E.; Richter, Oscar, and Ivy, A. C.: Pernicious Anemia: Treatment with Equine Liver Extract Injectable Either Subcutaneously or Intravenously, Arch. Int. Med. **50:** 538 (Oct.) 1932.
13. Cohn, E. J.: Personal communication to the authors.
14. West, Randolph: Personal communication to the authors.

by Minot and his associates,[15] but Heath,[16] Dameshek [17] and others have used this method in the determination of the optimal dosage of various preparations of iron in the treatment of the hypochromic anemias. The conditions of our observations are thus sufficiently established to make it certain that, if a uniform suboptimal amount of active principle is administered daily until the reticulocytes have reached and declined from the peak of their rise, a second response in reticulocytes will take place only if the potency of the second material given is greater than that of the first. Moreover, under these conditions a greater potency of the second substance is demonstrated if this second response in reticulocytes is greater than, equal to or even less than the first. If the potency of the second substance is not sufficiently greater than that of the first, no second reticulocyte response whatever will appear. Daily injections must be used since, if only one, even very large, injection is given and is not followed by another for several days, a second reticulocyte response can be obtained after a short period (from five to ten days) with an identical amount of active material. The stimulus to the bone marrow must therefore be continuously applied during the estimation of the comparative potency of each product.

Summary of Results of Reticulocyte Responses with Dilute and Concentrated Liver Extracts for Parenteral Use in Pernicious Anemia

	Period 1		Period 2		Period 3		
Patient's Initials	Preparation Used	Peak of Reticulocytes, per Cent	Preparation Used	Peak of Reticulocytes, per Cent	Preparation Used	Peak of Reticulocytes, per Cent	Interpretation
E. S.	B 5	13.4	D 5	20.2	....	...	D 5 > B 5
C. B.	D 5	10.4	B 5	No rise	B 33	6.6	B 33 > B 5
E. F.	B 5	9.8	C 5	5.4	D 5	3.9	C 5 > B 5; D 5 > C 5
R. I.	B 5	24.0	D 2.5	5.7	....	...	D 2.5 > B 5
E. F. 2	B 5	14.4	D 2.5	No rise	....	...	See case R.I.
L. D.	B 5	12.9	D 5	8.4	....	...	D 5 > B 5
H. M.	D 10	23.6	B 33	No rise	....	...	Dosage too great for conclusions
A. L.	E 5 (subcutaneous)	1.5	D 5	9.4	E 5 (intramuscular)	No rise	D 5 > E 5 (subcutaneously)
M. K.	E 10	6.4	D 10	11.9	B 33	No rise	D 10 > E 10
M. N.	E 10	10.5	D 5	22.0	....	...	D 5 > E 10

D = a dilute commercial extract.
B, C and E = concentrated extracts prepared by different drug firms.
> = greater in potency than.
A number following the letter for an extract denotes the amount of extract given in terms of the original weight of liver from which it is derived.

Satisfactory observations in ten patients with classic addisonian pernicious anemia were made in a study of four different extracts. The patients either were in their first relapse or had been subject to one or more relapses. A basal diet containing no liver and but little meat was used. The erythrocyte counts at the beginning of the assay varied from 780,000 to 2,000,000. Daily reticulocyte counts were performed. They were usually made with the "dry" method, a thin film of brilliant cresyl blue on a cover slip being used and counterstaining being done with Wright's stain. Hemoglobin and red blood cell counts were performed at least twice weekly, and frequently more often.

The injections were usually given deeply into the deltoid muscle, at times in the gluteal muscle. The volume of the extract to be given was carefully measured in a tuberculin syringe and then diluted to 1 cc. with physiologic solution of sodium chloride or distilled water before injection. After from ten to fourteen days of the daily injection of a uniform dose of one type of extract, the patient was given a second type of extract derived from the same amount of liver. The study is still under way and is being somewhat modified at present by the attempt to determine, if the amount of active material retained in one extract has been found to be greater than in another, what is the extent of that difference. This necessitates the use of different doses of different extracts in the same patient.

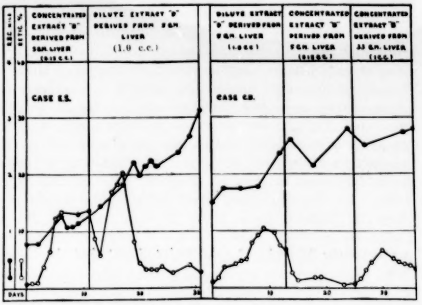
CONCENTRATED EXTRACT "B" DERIVED FROM 5GM. LIVER (0.25 C.C.)
DILUTE EXTRACT "D" DERIVED FROM 5GM. LIVER (1.0 C.C.)
DILUTE EXTRACT "D" DERIVED FROM 5GM. LIVER (1.0 C.C.)
CONCENTRATED EXTRACT "B" DERIVED FROM 5GM. LIVER (0.25 C.C.)
CONCENTRATED EXTRACT "B" DERIVED FROM 33 GM. LIVER (1.65 C.C.)
RBC. MILL.
RETIC. %
CASE E.S.
CASE C.B.
DAYS

Chart 1.—Patient E. S.: Definite response in reticulocytes when the amount of concentrated extract B derived from 5 Gm. of liver is given daily intramuscularly. When, however, dilute extract D is given daily in identical dosage, a second even greater response in reticulocytes occurs, indicating that there has been loss of active principle in preparation of the concentrated extract. Patient C. B.: The procedure is reversed in this case, dilute extract D being given first. Note the lack of a second response when concentrated extract B is given in identical dosage. When the dosage of concentrated extract is greatly increased in a third period, another response in reticulocytes occurs.

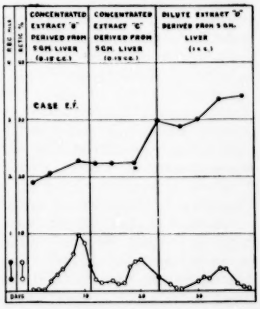
CONCENTRATED EXTRACT "B" DERIVED FROM 5GM. LIVER (0.25 C.C.)
CONCENTRATED EXTRACT "C" DERIVED FROM 5GM. LIVER (0.19 C.C.)
DILUTE EXTRACT "D" DERIVED FROM 5 GM. LIVER (1.0 C.C.)
RBC. MILL.
RETIC. %
CASE E.F.
DAYS

Chart 2.—A response in reticulocytes occurs when the amount of concentrated extract B derived from 5 Gm. of liver is given daily. However, a second response occurs when another concentrated extract C is given in identical dosage, indicating greater potency of the second concentrated extract. When dilute extract D is given in identical daily dosage in a third period, a third response occurs, indicating the greater potency of the dilute extract.

RESULTS

The liver extracts studied were in general of two main types: "dilute" and "concentrated." The "dilute" type D contained the material derived from 100 Gm. of liver dissolved in 20 cc. of solution. The "concentrated" extracts were three in number: B and C, two extracts containing the material derived from 100 Gm. of liver in 3 cc. of solution, and a third extract, E, containing the amount of material derived from

15. Minot, G. R., Murphy, W. P., and Stetson, R. P.: The Response of the Reticulocytes to Liver Therapy, Am. J. M. Sc. **175**: 581 (May) 1928.
16. Heath, C. W.: Oral Administration of Iron in Hypochromic Anemia, Arch. Int. Med. **51**: 459 (March) 1933.
17. Dameshek, William: Primary Hypochromic Anemia (Hypoferrism). III. A Comparison of Certain Compounds of Iron (Including Ferrous Glutamate and Ferrous Chloride) in the Treatment of Hypochromic Anemia, West Virginia M. J. **30**: 193 (May) 1934.

100 Gm. of liver dissolved in 10 cc. of solution. The results of the observations are summarized in the accompanying table.

Concentrated extract B was assayed in seven cases. In one of these cases (E. S.) the material (0.15 cc.) derived from 5 Gm. of liver was given daily for ten days followed by another ten-day period in which the amount of dilute extract D (1 cc.) derived from 5 Gm. of liver was given daily. A second reticulocyte response occurred, indicating that the dilute extract D derived from an identical amount of liver contained more of the active material than did the concentrated extract. This result was confirmed by observations of a similar type on patient L. D. In another case (C. B.) the dilute extract D derived from 5 Gm. of liver was given first, resulting in a significant reticulocyte response (10.4 per cent). When the concentrated extract B, derived from the same amount of original liver, was then given, no second reticulocyte response occurred. The results of the observations on patients E. S. and C. B. are shown in chart 1.

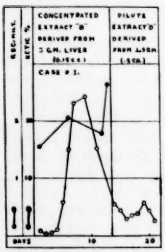

Chart 3.—A good response in reticulocytes occurs when the amount of concentrated extract B derived from 5 Gm. of liver is given daily. When, however, the amount of dilute extract D derived from only 2.5 Gm. is given daily, a second definite response in reticulocytes to 5.7 per cent occurs. This indicates that dilute extract D may possibly have more than twice the potency of concentrated extract B, and that the latter has suffered a marked loss of active principle during concentration.

Concentrated extract C proved to be more potent than concentrated extract B in another case (E. F.), as shown in chart 2. The third rise of reticulocytes shown in chart 2 occurred as a result of the daily administration of dilute extract D, derived from the same amount of liver as were the concentrated extracts. Dilute extract D was thus shown to be more potent than concentrated extract C. In another case (R. I.) concentrated extract B in daily dosage derived from 5 Gm. of liver produced a good response of reticulocytes (24 per cent). However, when dilute extract D was given in a daily dosage derived from only 2.5 Gm. of liver, a second significant rise to 5.7 per cent of reticulocytes occurred, as shown in chart 3. This observation suggests that concentrated extract B had suffered a loss of active material during the process of manufacture of more than 50 per cent. Since a repetition of this test on another patient (E. F. 2) gave no detectable second reticulocyte response, further observations are indicated before this can be stated with certainty.

Concentrated extract E was assayed in three cases. In one case (A. L.) no response whatever occurred when the material derived from 5 Gm. of liver was daily injected subcutaneously according to recommendation. A reticulocyte response, however, followed the immediately subsequent daily administration of dilute extract D derived from 5 Gm. of liver given intramuscularly. In a third ten-day period concentrated extract E was injected intramuscularly in the same dosage without a further response, as shown in chart 4. In a second case (M. K.) the daily intramuscular injection of concentrated extract E, derived from 10 Gm. of liver, produced a reticulocyte peak of 6.2 per cent. This was, however, followed by a second peak of 11.9 per cent when dilute extract D, derived from 10 Gm. of liver, was injected daily. This result is shown in chart 5. These observations indicate that the amount of active material in dilute extract D is greater than in concentrated extract E derived from identical amounts of liver. The latter extract, when given subcutaneously, perhaps suffers some loss in effectiveness. In a third case (M. N.) concentrated extract E, derived from 10 Gm. of liver, was injected intramuscularly each day with a resultant rise in reticulocytes to 10.2 per cent. When dilute extract D, derived from 5 Gm. of liver, was then given, a second rise of reticulocytes to 22.4 per cent occurred, as also shown in chart 5. This would indicate that the amount of active material in dilute extract D is more than twice as great as in concentrated extract E derived from a similar amount of liver.

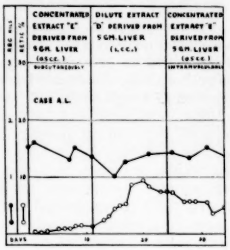
CONCENTRATED EXTRACT "E" DERIVED FROM 5 GM. LIVER (0.5 CC.) SUBCUTANEOUSLY
DILUTE EXTRACT "D" DERIVED FROM 5 GM. LIVER (1 CC.)
CONCENTRATED EXTRACT "E" DERIVED FROM 5 GM. LIVER (0.5 CC.) INTRAMUSCULARLY
CASE A. L.
DAYS

Chart 4.—No rise in reticulocytes occurs when the amount of concentrated extract E derived from 5 Gm. of liver is given daily subcutaneously. When, however, a dilute extract D is given intramuscularly in identical dosage, a definite response occurs, indicating (*a*) the ineffectiveness of subcutaneously given concentrated extract in suboptimal dosage, and (*b*) the greater potency of dilute extract D.

COMMENT

The clinical and economic advantages of parenterally given liver extract in the treatment of pernicious anemia are so numerous and so striking that they outweigh for most patients the slight disadvantage attending the use of a syringe and needle. Some of these advantages may be cited: 1. Use in treating a refractory case when even massive doses (extract from 600 to 900 Gm. of liver) are without much effect when given orally. 2. Use in treating the central nervous manifestations of the disease; especially has the outlook

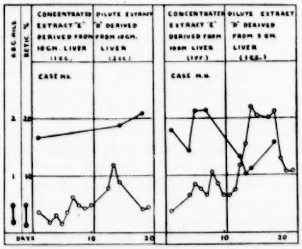
CONCENTRATED EXTRACT "E" DERIVED FROM 10 GM. LIVER (1 CC.)
DILUTE EXTRACT "D" DERIVED FROM 10 GM. LIVER (1 CC.)
CONCENTRATED EXTRACT "E" DERIVED FROM 10 GM. LIVER (1 CC.)
DILUTE EXTRACT "D" DERIVED FROM 5 GM. LIVER (1 CC.)
CASE M.K.
CASE M.N.
DAYS

Chart 5.—Patient M. K.: A slight rise in reticulocytes occurs when the amount of concentrated extract E derived from 10 Gm. of liver is given daily intramuscularly. When dilute extract D is given in identical dosage, a second even greater response occurs, indicating a greater potency of the dilute extract. Patient M. N.: A rise in reticulocytes occurs when the amount of concentrated extract E derived from 10 Gm. of liver is given daily intramuscularly. When dilute extract D is given in one-half this dosage (derived from 5 Gm. of liver) a second even greater response occurs, indicating that dilute extract D has more than twice the potency of concentrated extract E.

for patients with ataxia been made immeasurably brighter since the introduction of extract for parenteral use. 3. Use in treating a patient with a severe infectious state such as sepsis or pneumonia, or when swallowing is disturbed, as after dental extraction or tonsillectomy. 4. Use during conditions associated with impaired functioning of the gastro-intestinal tract

— nausea, vomiting, diarrhea — or even with simple anorexia, especially when an aversion to oral liver occurs. Unfortunately, these advantages have as yet not been fully utilized, owing in part to the obscurity surrounding the specifications of the available parenteral products and in part to the relative novelty of the method. The emphasis placed on "purification" and "concentration" has undoubtedly obscured the obvious fact that in the long run the simplest process in which the greatest amount of the original activity of the liver is conserved will be the most economical to the consumer.

The preparation of effective extracts of liver for parenteral use from the fraction G of Cohn is relatively simple and is already being carried out by several large hospitals. Desiccated commercial preparations of fraction G weigh about 4.2 per cent of the original bulk of the fresh liver and have already lost about 35 per cent of the original potency. This powdered extract may be dissolved in hot water, neutralized with sodium hydroxide, and allowed to settle for a week in the icebox after a preservative has been added. The supernatant fluid when passed through a Berkefeld filter results in a solution suitable for parenteral administration. The "concentration" of commercial preparations may be emulated if desired by dissolving as much of the original 4.2 Gm. of powder as will stay in solution in from 3 to 20 cc. of water.

If an attempt is made to dissolve 4.2 Gm. of fraction G in each of such volumes of water as will result in final volumes of liquid of 20, 15, 10 and 5 cc., respectively, increasing amounts of precipitate appear on sedimentation as the volumes decrease. Under these circumstances, the volumes of centrifugated sediments are about 2.5, 3.5, 7.5 and 90 per cent, respectively, of the foregoing final volumes. A picture of the inherent difficulties of concentration is afforded by this simple experiment. The evidence presented, which indicates losses of potent material with concentration, suggests that these visible residues are not altogether composed of inert material.

Solutions of the material derived from 100 Gm. of liver in 20 cc. of water should be of such potency that the extract derived from 10 Gm. of liver given daily or from 100 Gm. of liver given weekly is ordinarily sufficient to produce a maximal response of reticulocytes and red blood cells and to keep the patient in constant remission. A certain amount of the active material in more concentrated preparations will be lost. These apparently simple procedures result, curiously enough, in a tenfold increase in cost in certain of the available commercial products, not to mention an actual loss of active principle, which is often considerable. We fail to perceive, therefore, the advantage of further refinements, which may add to the cost of the process and conceivably diminish the quantity of active principle. As seen from our data, the dilute extract used was always more potent and in two instances was probably more than twice as potent, as concentrated extracts derived from identical amounts of liver.

It should be noted that this does not mean that concentrated products of identical volume, but derived from greater amounts of liver, may not contain more active material, as shown in case C. B. Indeed, it cannot be denied that, by dissolving a large amount of the powdered extract in a small quantity of water, a definite advantage is gained. Let us assume that a concentrated extract in which is dissolved material derived from 100 Gm. of liver in 3 cc. of liquid contains only about 50 per cent as much of the active principle as a dilute extract that is derived from the same amount of liver, although dissolved in 20 cc. of liquid. It then follows that the 3 cc. of "concentrated" liver extract will be equivalent in potency to 10 cc. of "dilute" extract.

The objectionable features of the present situation are simply that no quantitative statement of these differences in potency is available, and that each extract is stated to contain all the potency of the original liver. It is self evident that the simplest process that conserves the greatest amount of the original active principle of the liver will in the long run produce the most economical product. If concentration means the loss of considerable amounts of the active principle of the original liver, the consumer will naturally have to pay more for the remaining amount of active material. The specifications of a liver extract should not be based, as at present, on the amount of active principle with which the manufacturer began to work but on how much remains in the finished product. A discussion of the bearing of similar inadequacies on the economics of the oral therapy of anemia will be presented elsewhere.[18]

SUMMARY

The commercial extracts of liver for parenteral use are prepared in various concentrations, and descriptions of their potency are often vague. It was considered desirable to attempt comparative assays of the different products, using the principle of the "double" reticulocyte response on the same patient. This method necessitates the use of uniform suboptimal doses of liver extract given daily in successive ten to fourteen day periods.

Use of this method demonstrates that certain "concentrated" and "refined" solutions of liver extract for parenteral use have suffered a marked loss in the active principle, amounting possibly in certain cases to more than 50 per cent of the potency of the fraction G of Cohn, commonly used as the starting point in these preparations.

Until the specifications of the various commercial extracts for parenteral use are clearly defined in terms of what is a just maximal dose, it will be impossible for the practicing physician to obtain an accurate impression regarding the relative potency of the various extracts.

371 Commonwealth Avenue—Boston City Hospital.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. BETHELL, GOLDHAMER, ISAACS AND STURGIS AND DRS. DAMESHEK AND CASTLE

DR. L. G. ZERFAS, Indianapolis: I wish to bring out two points: first, the importance of the diet in the treatment of idiopathic hypochromic anemia, in addition to the iron; and, second, the desirability of correcting any pathologic condition that may be causing a loss of blood. Regarding the paper of Drs. Dameshek and Castle, certainly whole raw liver is the basis of all the liver extract fractions. Unfortunately it is difficult to administer, and various fractions derived from a given amount of liver indicate that not all of the active principle is obtained. Minot has estimated the loss to be from 30 to 35 per cent. There are other experiments which bear out what Drs. Dameshek and Castle have said. Dr. Ryman has taken 10 Gm. of raw liver and digested it with gastric juice; with that amount of liver he was able to produce a maximum reticulocyte response in pernicious anemia. My associates and I have taken one vial of liver extract, the amount derived

18. Castle, W. B., and Dameshek, William: Research for the Benefit of the Consumer of Commercial Remedies for Anemia, Tr. A. Am. Phys., 1934, to be published.

from 100 Gm. of liver, incubated it with normal human gastric juice, from 50 to 100 cc., and obtained maximal reticulocyte responses. This probably means that there are other substances in the liver extract on which the intrinsic factor of the gastric juice acts to produce an additional amount of active principle. The fact that 10 Gm. of raw liver incubated with human gastric juice or one vial of liver extract so treated can produce a blood response equal to that produced when from 200 to 300 Gm. of whole liver is fed daily indicates that there is another substance in the extract aside from the active principle, which is lost through fractionation. It is only reasonable to assume that there must be some loss of active principle by chemical fractionation. Drs. Dameshek and Castle brought out that there is a great variation in the potency of different commercial preparations largely because their potency has been oased on the amount of original liver from which the fractions were derived rather than on a definitely standardized means of testing. Some such methods as they utilized should be employed. When the diagnosis of pernicious anemia is made and liver extract or stomach tissue or other potent substance is recommended, the patient may simply go to the drug store and buy the material, in which instance he regulates his own treatment. When the patient receives injectable liver extract, the physician has an opportunity to regulate the therapy and to observe the clinical condition of the patient, all of which is vitally important to the patient's welfare.

DR. CYRUS C. STURGIS, Ann Arbor, Mich.: I wish to emphasize two points. If one wishes to obtain an effect from iron in the treatment of any anemia, there are two things one must consider. The first is that iron will do no good unless there is an iron lack or deficiency in the patient. Secondly, an effect on the anemia will not be produced by the use of iron medication unless very large doses of this drug are given. The dose in the Pharmacopeia is very much too small. For instance, the dose of reduced iron is 1 grain (0.065 Gm.). I give 0.5 Gm. three times a day, or 22½ grains (1.5 Gm.) of iron daily in order to produce an effect. Drs. Dameshek and Castle may be criticized by some because they have placed a great deal of dependence on the reticulocyte response as a criterion of the efficacy of the preparations which they have injected. However, I believe they are entirely correct. It is true that one criterion of the effectiveness of a drug in pernicious anemia is the amount of hemoglobin and red blood cells produced in a given period of time. After six or seven years' experience with the reticulocyte response, I am convinced that it is likewise a very accurate method of assay of any preparation employed in the treatment of pernicious anemia. Various criticisms have been offered in rejecting the reticulocyte response as a method of assay, but I think that experience over these years indicates that it gives valuable and correct information. Some say that the methods of staining reticulocytes are ineffective, others that too much dependence is placed on the peak of the reticulocytes to tell whether the drug is effective or not; but despite these criticisms I believe that the value of this method has been demonstrated.

DR. W. P. MURPHY, Boston: There are three means of testing the potency of a liver substance for use in pernicious anemia: (1) the rate and magnitude of the reticulocyte rise, (2) the rate of the erythrocyte increase and (3) the determination of the amount of material necessary to maintain the blood at a normal level in patients observed over long intervals of time. Owing to individual variations, perhaps because of complicating factors or even seasonal variations, data concerning the actual potency of material are of value only if obtained in a large series of cases uniformly treated and, in the case of maintenance treatment, only if followed for relatively long periods. Observations of the magnitude of the reticulocyte rise are not a reliable means of testing the potency of actively potent material. Although the method used by Drs. Dameshek and Castle may eliminate some of the difficulties observed in the use of this method if used in a large series of cases, there are obvious reasons why it may not be reliable. The two latter methods offer an accurate and reliable means of determining the potency of and recording the actual value to the patient of any liver substance used. Last year I presented data showing the rate of increase of the erythrocytes following the use of a concentrated solution of liver. In a consecutive series of more than forty cases showing initial red blood cell counts below the 2,000,000 level, the average daily increase was 100,000 cells during a period of one month. The amount of material used ranged from four to seven vials of 3 cc. each prepared from 100 Gm. of liver (Lederle). In the 1934 Scientific Exhibit a series of ninety cases is presented followed for periods varying from one-half to two and one-half years, in which the blood level was maintained at 5,000,000 or more cells per cubic millimeter, the average interval between injections of one vial, or 3 cc., of the concentrated solution was a little over one month. It may be seen from these data that the patients are being treated and maintained in excellent condition with a minimal dose of material and with the least disturbance to the individual. This is of particular interest because many patients come from long distances and more frequent dosage would be a considerable expense and inconvenience to them. Considering the small cost of the material and the fact that few injections are necessary, it is obvious that these patients are being maintained at a minimum of expense and inconvenience to them. I believe that these methods should be used not only to determine the purely academic question as to the relative potency of various concentrations of liver extract but the more important one, both to the patient and to the physician, of the most efficient and most satisfactory extract to use for the patient.

DR. ADOLPH SACHS, Omaha: In the various forms of iron deficiencies, whenever iron decreases the whole blood copper increases. As the anemia improves, the iron increases and the whole blood copper decreases. This offers another guide by which one can follow the benefit of any therapeutic measure. In 250 determinations made on normals, it was found that 132 micrograms of copper per hundred cubic centimeters of blood is the normal whole blood copper. This is similar in the female and in the male, with a very small variance. There are but few exceptions. In over 250 determinations a copper anemia has never been found. So in therapy I always find that copper is already present in sufficient quantity to supply the amount needed. I find in my experiments that copper is probably a great biologic catalyst.

DR. C. W. EDMUNDS, Ann Arbor, Mich.: The view in regard to the difference in potency in the different preparations derived from the same amounts of liver is, of course, of comparatively recent origin. The members of the Council on Pharmacy and Chemistry realize that the descriptions of potency in N. N. R. at present are not strictly correct. A very serious problem has to do with the description and testing of these products under the new Pharmacopeia. It is most difficult to decide on some phrase that will describe the potency of these products. A product from 100 Gm. of liver when it is in 10 cc. may be of an entirely different potency from a product derived from 100 Gm. when it is concentrated to 3 cc. In all the comments that have been made, I haven't heard one suggestion as to how this could be expressed in the Pharmacopeia, and that is of the utmost importance from the standpoint of the government supervision of these products. The chapters for these new monographs have all been prepared with the help of Drs. Minot, Castle, Sturgis and Isaacs and are as perfect monographs as can be obtained in the present state of knowledge, except for this final phrase concerning the statement of potency. The assay is on reticulocytes, which is the only available and practical test at the present time. The statement giving the amount of liver used is not sufficient, except from the economic standpoint; it is the amount of performance and potency that is important. I have suggested to Dr. Isaacs and to Dr. Minot that products should be labeled to show how many cubic centimeters or grams of the product would bring about the standard increase in reticulocytes. In other words, the reticulocyte increase with a certain number of red cells is the important thing. The matter is not settled. The copy is at the present moment in Dr. Minot's hands and, I think, will go before the general committee of revision within the next two weeks and I hope we can come to some satisfactory solution of this really extremely difficult problem.

DR. FRANK H. BETHELL, Ann Arbor, Mich.: Most of our patients, before coming under observation, had had a reasonably adequate and well balanced diet. However, an occasional

individual has been seen, with achlorhydria and without a history of any blood loss, who has presented an anemia of secondary type. Such patients are usually elderly, and the diet may have been inadequate over a period of many years. It is in this group that we feel dietary correction to be of particular importance. In the treatment of patients with iron deficiency anemia we do not believe that any diet is of specific benefit. In regard to copper, we have shown experimentally following the work of Hart, Steenbock, Elvehjem and Waddell that copper apparently plays an essential rôle in the utilization of iron in hemoglobin formation. However, any ordinary diet will supply between 2 and 4 mg. of copper a day, which is as much as is supplied by the recommended dosages of many therapeutic preparations of iron and copper.

DR. WILLIAM DAMESHEK, Boston: Dr. Murphy's criticisms undoubtedly are correct in many respects. The reticulocyte response at times does not work, particularly in refractory patients. On the other hand, as Dr. Murphy has brought out in one of his articles on the subject, the reticulocyte rise and not the red cell response is important when the liver extract is given not in maximal but in submaximal dosage. Regarding Dr. Murphy's criticism of the number of cases, I wish to state that we have utilized this method of investigation in fourteen cases, in ten of which satisfactory observations were made. In each case comparisons of two or more extracts were made. This has been done over a period of a year and a quarter. We do not regard the job as finished and hope to interest others. It has been very difficult to obtain suitable patients. Many patients obtain all kinds of "shotgun" medications containing a certain amount of liver extract, and when they come to the hospital for treatment they are not suitable for testing. Dr. Castle and I have felt, therefore, that it was necessary to test the materials out on the same patient. Individual patients may differ greatly in their manner of response. In the same patient, if the material is given in the same fashion daily, the "double" responses are of great significance. These observations may possibly be considered of only academic interest since all the extracts tested work more or less well. We as physicians should, however, know as much as possible about any pharmaceutic product that we administer, especially as our patients have to pay for our services and prescriptions. Dr. Edmunds has brought out some very important points. Dr. Castle and I have many times discussed the question of how these products should be labeled. We have found that an easily prepared dilute liver extract almost always produces a maximal response from the daily injection of the material derived from 10 Gm. of liver. Our interest in the matter is not to advocate any particular type of commercial product but to urge the definition of the potency of all acceptable products in terms of that dosage of each which will have approximately the same hematopoietic effect. Such a definition should meet no objection on the part of any reputable commercial drug firm.

The Phylogeny of Blood-Forming Tissues.—In phylogeny the fundamental blood-forming organ, the spleen, apportions its functions of lymphocytopoiesis and erythrocytopoiesis at the higher levels, respectively, among lymph nodes and bone marrow. It retains prominently in the mammalian adult only the functions of lymphocyte and monocyte formation. Since the lymph nodes also perform these functions to a high degree, the spleen represents as regards its primary function of blood formation only a vestigial organ. However, by virtue of its reticular stroma, its lymphocyte parenchyma and its sinusoidal venous circulation, it retains its evolutionary and fetal potentiality for the formation of the red cells. In this case of adenocarcinoma of the prostate both the lymph nodes and the bone marrow were largely eliminated from the hemocytopoietic system by reason of extensive metastases, and the spleen was stimulated to assume as a compensatory measure its original erythrocytopoietic activity. The condition roughly parallels the evolutionary level of the Amphibia in which the bone marrow has only slight erythropoietic activity, the spleen being the dominant organ in the production of red cells.—Jordan, H. E.: Extramedullary Erythrocytopoiesis in Man, *Arch. Path.* **18**:1 (July) 1934.

THE EARLY HISTOLOGIC DIAGNOSIS OF CARCINOMA OF THE UTERINE CERVIX

HENRY SCHMITZ, M.D.
AND
E. L. BENJAMIN, M.D.
CHICAGO

In a previous paper the histologic changes in seventy-five cases of chronic cervicitis as revealed by serial sectioning were described.[1] In six of these, blastomatoid changes consisting of cellular and nuclear deviations in size, shape and chromatism, epithelial heterotopia and stroma reaction were present. We designated these changes as neoplasia. It was made clear that it was imperative to follow up the patients in whom this neoplasia was found, to determine the significance of the cellular changes. To these six cases, in the course of time, three more were added, so that we have now nine cervices with blastomatoid changes. Eight were treated immediately with adequate doses of radiation as used in carcinomas, and normal anatomic conditions were obtained. One patient was not treated and a report of the case will now be given:

Jan. 30, 1933, a low circular amputation of the cervix of Mrs. S. was done. The clinical diagnosis was leukoplakia of the cervix, and the amputation was done because the pathologic changes were extensive. The patient had lost 30 pounds (13.6 Kg.) during the last year. She had had a profuse brownish discharge mixed with blood for four or five months three years previously, and the discharge had been present continuously since May 1932. There was no odor, but the underwear was saturated daily. A cystic tumor of the ovary had been removed fifteen years previously and laparotomies for two tubal pregnancies had been performed twelve and thirteen years previously. The menstrual history was not important except that the menopause had occurred two years previously, when the patient was 44 years of age.

Pathologic examination showed that sections extending in the long axis of the cervical canal to include 10 mm. of the vaginal lip of the cervix were covered with stratified squamous epithelium, and another 11 mm. lined with columnar epithelium was partially eroded (fig. 1). The mucosa of the vaginal lip was thicker than normal, in spite of desquamation (artefact) of part of the superficial zone. There was a well developed stratum granulosum present, consisting of from three to four layers of flattened cells containing keratohyaline granules and interposed between a superficial clear eosinophilic cellular layer and a rete malpighii. The palisade arrangement of the basal layer was fairly constant; the basement membrane was intact. The tunica propria was edematous and infiltrated with lymphoid cells, plasma cells and polyblasts. Numerous preformed vessels, lined with a single layer of endothelium, were plainly seen (fig. 2).

As the stratified squamous epithelium approached the external os it increased in thickness to form broad flat epithelial papillae. The stratum granulosum became more distinct. The reaction within the tunica propria was exaggerated. An abrupt transition of the stratified squamous epithelium was seen exhibiting neoplastic tendencies characterized by loss of normal architecture, with a thickened stratum corneum, well developed stratum granulosum and hypertrophy of the rete malpighii. Loss of polarity, hyperchromatism and variations in size and shape were exhibited within the rete malpighii (fig. 3). The average diameter of 500 nuclei in this area was 0.020 mm.; the extremes were 0.012 mm. and 0.036 mm. The average diameter

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From the Departments of Gynecology and Pathology, Loyola University School of Medicine, and the Mercy Hospital Institute of Radiation Therapy.
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1. Schmitz, Henry; McJunkin, F. A., and Macaluso, M. A.: Histopathology of Epithelial Hyperplasia and Neoplasia of the Cervix Uteri, Am. J. Obst. & Gynec. **27**: 336 (March) 1934.

of 500 nuclei in the rete malpighii of the mucosa of the vaginal lip was 0.017 mm.; the extremes were 0.012 and 0.024 mm. An intense stroma reaction was present beneath the epithelium. The diagnosis was leukoplakia with early epidermoid carcinoma of the uterine cervix.

The cervix healed by first intention. The patient returned, June 26, complaining of a recurrence of the brownish discharge since June 5. However, on examination nothing of importance was found until October 26, when friable tissue was discovered at the external cervical os. A biopsy specimen was taken and the diagnosis of epidermoid carcinoma of the cervix (fig. 4)

Fig. 1.—Leukoplakia; beginning epidermoid carcinoma of the uterine cervix. Transition in the character of the mucosa, downward growth and broadening of the epithelial papillae and subepithelial chronic inflammatory infiltration are shown. The lighter area to the right in the stratum mucosum is due to a technical staining defect. Reduced from a photomicrograph with a magnification of 65 diameters.

was made. The patient was treated with 50 mg. of radium element placed directly in the cervical canal until 2,400 milligram element hours was attained, and with the application of roentgen rays of 800 kilovolts to a suprapubic and a sacral field. The dosage applied to each field was 2,100 roentgens in ten fractional doses. Since the anteroposterior diameter was 16 cm., a dose of 2,600 roentgens was attained in the midpelvis. The patient had a rather severe reaction but overcame it gradually within two months, at which time examination revealed an anatomic healing of the cervix.

This is an instance in which, ten months prior to a diagnosis of typical carcinoma, the microscopic examination of the cervix showed leukoplakia, atypia and neoplasia of the epithelial cells, a negligible amount of epithelial heterotopia and a stroma reaction. Such blastomatoid changes are apparently irreversible and should be considered as the earliest histologic evidence of carcinoma of the uterine cervix. This case is reported as proof that such blastomatoid changes should be considered malignant. We are of the opinion that, if such cases are not treated adequately at the time of their detection, they should be kept under close clinical observation. If marked heterotopia and breaking through of the basement membrane have occurred, the patient should be immediately and adequately treated by surgery or radiation. It will become the duty of the physician and pathologist to subject all cervical tissues removed at operation to serial sectioning and the changes of neoplasia should be considered as the earliest histologic evidence of carcinoma of the uterine cervix.

The detection of early carcinomas of the cervix can be attained only by employing palpation and inspection of the genital organs as part of every physical examination. Linear cauterization of the vaginal portion of the cervix will cure chronic cervicitis. If the lesion does not heal or if it recurs, low circular amputation of the diseased part of the portio vaginalis and microscopic examination of serial sections of all the tissues will lead to an early diagnosis of cancer.

ABSTRACT OF DISCUSSION

DR. EMIL NOVAK, Baltimore: In the great majority of cases, the diagnosis of cervical cancer can be made with reasonable certainty by the simple clinical methods of inspection and palpation, the microscope being used for confirmation. In the early and doubtful cases, the microscope must make the diagnosis. Since it is this early group which physicians are constantly striving to increase, the microscopic examination is becoming increasingly important but increasingly difficult. The reason for this lies in the fact that physicians are learning to recognize that certain epithelial cell characteristics which they had formerly looked on as distinctive of cancer may be found in lesions that are obviously not malignant. In the case of frank carcinoma, the microscopic diagnosis can usually be made almost at a glance, and with the low power, from the characteristic disorderly and invasive pattern of the growth. When the latter is lacking, it has been rather generally accepted that the presence of such features as mitoses, hyperchromatosis and disparity in cells and nuclei constitutes adequate evidence of a malignant condition. Many errors have been made because of this view, and, in the diagnosis of early epidermoid cervical cancer, evidence of invasiveness must usually be required to establish the diagnosis. During the past few years, the interest of gynecologic pathologists in this new field of "precancerous," "pseudomalignant" and "carcinoid" lesions has been intensified, probably chiefly because of the publications of Hinselmann and Schiller. Even in mild inflammatory lesions, mitoses in the basal layers may occasionally be found, and they are not uncommon in leukoplakia, though the latter is certainly a benign lesion, and though, in spite of a few reported cases, there has been no adequate evidence to indicate that it is a precursor of cancer. The so-called squamous metaplasia is clearly benign, and here again there is little reason to look on it as having any more influence in the development of cancer than pertains to any chronic irritative lesion. Of much greater interest, however, are the cases of what may be called intra-epithelial epithelioma, in which the epithelial layer shows unmistakable evidence of growth accceleration, with large, heavily stained nuclei, numerous mitoses, often parakeratosis, disparity in size of cells and nuclei—in short, all the histologic characteristics of carcinoma except for heterotopia. These pictures, so similar

Fig. 2.—Mucosa of the vaginal lip, showing hyperplastic epithelium with subepithelial stroma reaction. Reduced from a photomicrograph with a magnification of 210 diameters.

in many instances to the Bowen's disease of dermatologists that this term has come to be employed for lack of a better one, are being encountered more and more often. Do they represent early cancer or not? There is no way to determine this except to learn their effect on the life and health of the patients.

DR. JOSEPH COLT BLOODGOOD, Baltimore: It was my privilege to hear Dr. Schmitz with my classmate Dr. John Clark and Dr. Burnam give the first symposium on the treatment of cancer of the cervix with radium, in Chicago in 1914 or 1915. Each had a somewhat different method of treatment, but they all used radium salts or radon, and apparently at the end of five years their results were identical. They were curing

a certain percentage even of inoperable cases, and today their treatment is accepted throughout the world as the treatment for cancer of the cervix. Dr. Schmitz is discussing early histologic diagnosis of cancer of the cervix, and my opinion is that, when one must use the microscope to demonstrate whether the lesion of the cervix is malignant or not, the chances of a cure are best. The fact that Dr. Schmitz devotes his entire paper to this most important side is a demonstration that he is getting early cases. The cures today in the great clinics of the world are about 35 per cent, all cases being grouped together, and they vary from more than 90 per cent in the early stage to less than 10 per cent in group 4, the group of inoperable and extensive cancer. Nevertheless in the majority of cases cancer of the cervix is a preventable disease, and this prevention rests on the education of mothers and the education of physicians who take care of mothers' special troubles. Every woman should have a pelvic examination within six months and one year after the birth of her last child, and at as frequent intervals thereafter as her physician thinks best. This is as important as the protection of a child at 6 months of age against diphtheria by the use of toxoid. The early histologic diagnosis of cancer of the uterine cervix is the next most important thing. Ultimately, in the majority of cases, cancer of the cervix should be found with the microscope, and when it is found in this early stage the chances of a cure by physicians properly trained in the use of radium should be more than 90 per cent.

DR. FRED WETHERELL, Syracuse, N. Y.: Dr. Schmitz finds early cases in his own private practice, but the cases that I see are the late cases which have been seen by the family physician. It is sad to see years go by and the cases referred to one in advanced stages, cases which have gone for months and sometimes even years. When the time comes that

Fig. 3.—Leukoplakia of the nonkeratizing epithelium of the portio vaginalis at the lip of the uterine cervix. Hyperkeratosis, parakeratosis and the formation of a well defined stratum granulosum are shown. Intercellular, intranuclear and perinuclear edema with variations in size and shape of the cells and hyperchromatism are present in the stratum spinosum and stratum germinativum. Reduced from a photomicrograph with a magnification of 475 diameters.

this group and other individuals interested in early diagnosis can have the patients which will make Dr. Bloodgood's and Dr. Schmitz's workers question the biopsy sections, the answer will have been reached as Dr. Bloodgood has suggested to early cure and cure in a large percentage of cases.

DR. HENRY SCHMITZ, Chicago: The points I wanted to bring home are as follows: If neoplasia is found in the cervix after surgical amputation and there is no penetration of basement membrane, it may be assumed that the surgical amputation has removed all the pathologic tissue, and follow up of these cases is all that is really necessary. On the other hand, if in these early carcinomas the penetration of basement membrane has occurred so that the classic microscopic diagnosis of carcinoma can be made, it is clear that these cases should be

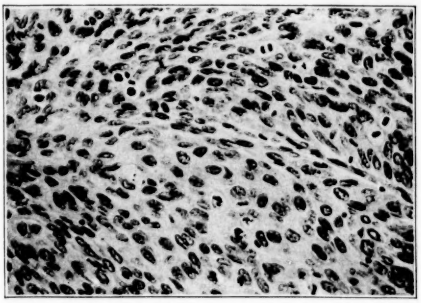

Fig. 4.—Primary epidermoid carcinoma of the uterine cervix from a biopsy specimen taken ten months after removal of tissue illustrated in figures 1, 2 and 3. Neoplasia, anaplasia and hyperchromatism with numerous mitotic figures are shown. Other fields show attempts at pearl formation. Reduced from a photomicrograph with a magnification of 500 diameters.

treated adequately according to established principles. I am positive in making the statement that if cases could be treated at this time and not when they are clinically recognizable, more than 90 per cent of the cases of carcinoma of the uterus would obtain a good five year end result.

THE ESTIMATION OF FUNCTIONAL DISABILITY IN THE PULMONARY FIBROSES

WILLIAM S. McCANN, M.D.
ALBERTO HURTADO, M.D.
NOLAN KALTREIDER, M.D.
AND
WALTER W. FRAY, M.D.
ROCHESTER, N. Y.

Pneumonoconiosis presents a medicolegal problem of major importance. Many studies exist which deal with its etiology and pathogenesis and its diagnosis by roentgenograms, but so far little attention has been paid to its physiologic aspects, though their practical importance is obvious. Especially is this so in view of the growing tendency to adjust awards of workmen's compensation to the degree of disability. In order to do this properly it is essential that objective means of estimating disability be sought which will be fair alike to workman and employer. With this in mind we have carried out investigations on the respiratory function of fifty-three cases of pulmonary fibrosis of various types, not all of which were pneumonoconioses.

The function of respiration is one jointly mediated by the heart, the blood and the lungs. It was apparent at the outset that the functional examination should be

From the Department of Medicine, University of Rochester School of Medicine and Dentistry, and the Medical Clinic of the Strong Memorial and Rochester Municipal hospitals.

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complete as regards all three of these factors. Our studies of the lungs have dealt with the pulmonary capacity and its subdivisions, with the tidal air, dead space, alveolar gases and response of the pulmonary ventilation to exercise. They have included the usual diagnostic roentgenographic studies, together with measurements of areas of the pulmonary fields during maximum inspiration and expiration, with observations as to the behavior of the ribs and diaphragm. The blood has been carefully studied in each case as to count, hemoglobin, cell and plasma volume and gas content, particularly of the degree of saturation of the arterial blood with oxygen. The heart has been carefully measured roentgenologically. Electrocardiograms have been made in each case, and the cardiac output has been measured in a large proportion of them, Grollman's [1] method being used. The enormous amount of data accumulated cannot be completely presented here. It is in the process of publication elsewhere. We will confine ourselves at this time to a discussion (1) of the correlation of roentgenographic studies with the measurements of the pulmonary capacity and of the saturation of the arterial blood with oxygen, and (2) of our observations on the ventilation of the lung during exercise.

The total pulmonary capacity and its subdivisions were measured by the method of Christie.[2] While similar measurements have been made previously by many investigators, a search of the literature revealed data concerning few normal subjects and no basis on which to estimate the normality of the values observed. Hurtado and his co-workers [3] undertook to establish

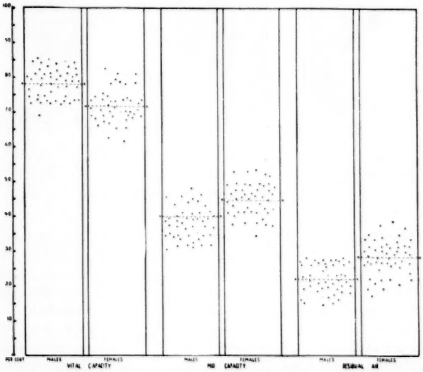


Fig. 1.—Relative values of the various subdivisions of the pulmonary capacity observed in sixty normal males and fifty normal females. The dots represent individual observations grouped about the mean values.

normal values by a study of sixty normal men and fifty normal women. The values of pulmonary capacity were correlated with various bodily and roentgenographic measurements. The best correlation was found to exist between the vital capacity and the radiologic chest volume at maximum inspiration, measured with a planimeter traced on a roentgenogram made by a special technic at a distance of 6 feet. This technic involved the use of filters through which the films were doubly exposed, once at maximum inspiration and once at maximum expiration. A formula has been derived by which the normal value of the pulmonary capacities may be predicted with an agreement between predicted and observed values within 15 per cent.[4]

Pulmonary Capacity and Its Subdivisions in Fifty-Three Cases of Pulmonary Fibrosis

Group		Total Capacity, per Cent of Normal	Vital Capacity, per Cent of Normal	Residual Air, per Cent of Normal	Ratio Residual Total, per Cent	Arterial Saturation with O_2, per Cent
I	Average	84	73	125	32	94.0
	Range	65-99	59-87	70-192	20-43	91.4-98.5
II	Average	95	55	135	54	89.5
	Range	75-109	36-76	139-352	37-73	81.5-92.1
III	Average	77	62	232	30	90.0
	Range	50-105	28-86	105-215	26-56	80.6-96.3
IV	Average	79	62	141	38	93.8
	Range	74-89	58-70	97-197	28-49	92.2-95.7
V	Average	82	47	205	54	90.0
	Range	69-97	42-51	138-262	44-59	87.3-92.7
VI	Average	60	43	123	56	83.8
	Range	58-64	32-57	62-176	24-61	71.9-91.9

The normal partition of the pulmonary capacity between vital capacity and residual air has also been determined, and also of the mid capacity (taken at the end of a normal expiration). The relations between these subdivisions as determined in fifty normal males and fifty normal females are shown graphically in figure 1. The grouping of dots about the lines representing mean values gives the normal limits of variation observed.

In order to determine to what extent the roentgenograms of the lungs give clues as to the degree of functional impairment of respiration, the fifty-three cases of pulmonary fibrosis were divided into six groups, according to the anatomic type of fibrosis revealed. No other satisfactory basis of classification could be found. An etiologic classification was impossible for several reasons. In the first place it is never possible to determine with certainty the etiology of pulmonary fibrosis from a roentgenogram, even when a reliable history of occupational exposure to dust is obtained. It is difficult to exclude the possibility of infectious fibroses, particularly in a group composed largely of litigants who cannot be relied on to give the full truth regarding nonoccupational illnesses. Furthermore the majority of our patients were in the fifth and sixth decades, in which cardiovascular disease has a fairly high incidence as a cause of pulmonary fibrosis and respiratory disability.

The grouping of the cases of fibrosis is as follows:

I. More than usual fibrosis in patients giving no history of asthma. A typical roentgenogram of this group is shown in figure 2. The group includes incipient cases of pneumonoconiosis, chronic nontuberculous respiratory infection and cases presenting cardiovascular disease, making a total of twenty-two cases.

II. More than usual fibrosis of linear type, with emphysema in patients giving a history of asthma. A roentgenogram typical of this group of seven cases is shown in figure 3.

III. Simple nodular fibrosis, giving the diffuse "snowstorm" appearance characteristically produced by miliary tuberculosis

1. Grollman, Arthur: The Cardiac Output of Man in Health and Disease, Springfield, Ill., Charles C. Thomas, 1932.

2. Christie, R. V.: The Lung Volume and Its Subdivisions: I. Methods of Measurement, J. Clin. Investigation **11:** 1099 (Nov.) 1932.

3. Hurtado, Alberto, and Beller, C.: Studies of Total Pulmonary Capacity and Its Subdivisions: I. Normal, Absolute and Relative Values, J. Clin. Investigation **12:** 793 (Sept.) 1933. Hurtado, Alberto, and Fray, W. W.: Studies of Total Pulmonary Capacity and Its Subdivisions: II. Correlation with Physical and Radiological Measurements, ibid. **12:** 807 (Sept.) 1933. Hurtado, Alberto; Fray, W. W.; Kaltreider, N. L., and Brooks, W. D. W.: Studies of Total Pulmonary Capacity and Its Subdivisions: V. Normal Values in Female Subjects, ibid. **13:** 169 (Jan.) 1934.

4. Hurtado and Fray.[3] Hurtado, Fray, Kaltreider and Brooks.[3]

or silicosis. Figure 4 is typical of this group, which includes fifteen cases.

IV. Similar to group III except that agglomeration of nodules is beginning, with emphysema in intervening areas. Figure 5 is typical of the group of three cases.

V. More advanced agglomeration forming dense shadows in the midzone and upper portions of the lungs with marked emphysema of the bases, tenting of the diaphragms, and the like. Figure 6 is typical of the three cases of this group.

VI. Fine, diffuse reticular fibrosis without nodulation. Figure 7 is typical of three cases of this group.

In figure 8 are graphically shown the average values for the predicted and observed values of pulmonary capacity for each group. In this, one observes a progressive tendency for the vital capacity and total capacity to diminish as the degree of fibrosis increases, except in group II, in which the total capacity is nearly normal, owing to the large value of the residual air, probably representing the emphysema induced by the repeated attacks of asthma.

The functional significance of these conditions is better appreciated by the data in the accompanying table, in which are given the average data for pulmonary capacity and its subdivisions, and the range of variation within each group. These data are compared with values for the saturation of the arterial blood with oxygen.

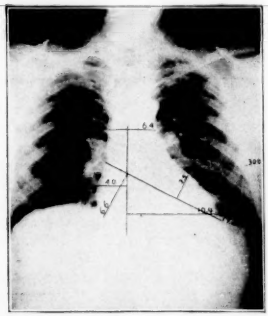


Fig. 2.—Typical of group I. The total capacity was 6 per cent and the vital capacity 12.7 per cent below normal. The residual air was 17.3 per cent above normal. The ratio RA: TC was 27.5 per cent.

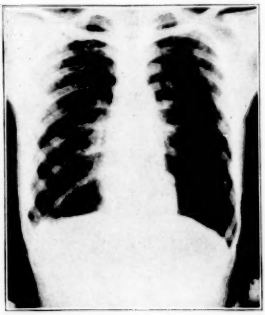


Fig. 3.—Typical of group II: The total capacity and vital capacity were decreased to 85 and 41 per cent of normal, respectively. The residual air was 241 per cent of normal. The ratio RA: TC was 62.5 per cent. Arterial oxygen saturation was 92 per cent.

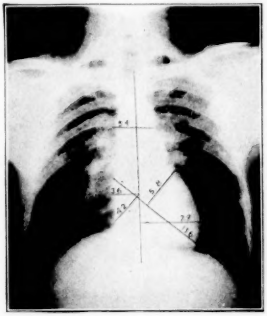


Fig. 4.—Typical of group III: The total capacity was 71 per cent of normal, vital capacity 58 per cent, and residual air 116 per cent. Ratio RA: TC was 36 per cent. Arterial oxygen saturation was 81 per cent.

The usual changes observed in these cases of pulmonary fibrosis consisted of a moderate decrease in the total capacity, a more marked decrease in the vital capacity and in most cases a moderate increase in the residual air. Not infrequently the latter volume was found to be abnormally high. It appears from this table that the average values of these changes are proportional to the degree of fibrosis, as revealed in the roentgenogram; but the wide variation within each group indicates that a very imperfect idea of the degree of functional impairment of the lungs can be derived from the roentgenograms alone. The necessity for individual and complete study of each case is obvious.

In the analysis of our data the ratio of residual air to the total pulmonary capacity appears to have great functional significance. The saturation of the arterial blood with oxygen is less than the normal 94 per cent in every case in which the ratio of residual air to total capacity is more than 49 per cent. With the ratio at 45 per cent only one patient and at 40 per cent only four patients were normally saturated with oxygen.

One might be tempted to assume that the borderline of complete disability had been reached whenever the saturation of the arterial blood at rest was less than normal. This would undoubtedly be a faulty assumption in view of the fact that Hurtado [5] found that the arterial blood of natives of the high Peruvian Andes is always less saturated with oxygen than is the case with normal individuals at sea level. In spite of the partial anoxemia, the Peruvian natives are capable of performing hard labor in the mines.

In the hope of finding some basis for estimating the capacity for work of our subjects, we have studied the respiration during physical work. The subjects sat in a chair-like seat from which they operated the pedals of a bicycle, which turned a metal wheel against the resistance of a simple mechanical brake. The subjects were urged to exert themselves to the utmost, during which time the expired air was collected in a spirometer. The volume of this air and the rate of respiration was recorded graphically and charted for each half minute period. The actual work performed was not measured, the object being merely to record the maximal ventilation of the lungs to which the subject could attain in any half minute period.

Sturgis, Peabody, Hall and Fremont-Smith [6] observed the maximal minute volume of respiration in twelve young men. Their observations led them to suggest a formula for roughly predicting the maximal minute volume, which they found to be attained when the tidal air equals one third of the vital capacity and the rate of breathing is 34 per minute. The maximum minute volume was about twelve times that of the value observed when the subject was lying down at complete rest. This maximum value was one

5. Hurtado, Alberto: Studies at High Altitude: Blood Observations on the Indian Natives of the Peruvian Andes, Am. J. Physiol. **100:** 487 (May) 1932.

6. Sturgis, C. C.; Peabody, F. W.; Hall, F. C., and Fremont-Smith, Frank Jr.: Clinical Studies on the Respiration: VIII. The Relation of Dyspnea to the Maximum Minute-Volume of Pulmonary Ventilation, Arch. Int. Med. **29:** 236 (Feb.) 1922.

that could be maintained for only short periods (one and one-half minutes of extreme effort). They observed that normal subjects were not conscious of breathing at 25 per cent of maximal capacity, and that they were conscious of it at 50 per cent and frankly short of breath when the minute volume was 75 per cent of the maximal value. When the vital capacity was reduced artificially by tight binding of the chest the maximal ventilation was likewise reduced, and the percentages at which moderate and severe dyspnea were noted were relatively the same, 50 and 75 per cent, respectively. These results, however, were attained with highly intelligent, cooperative, trained subjects who could be depended on to exert themselves to the utmost of their ability.

In our series it was possible to select ten subjects with pulmonary fibrosis and five subjects with emphysema who were not engaged in litigation and who appeared to be highly cooperative. In these cases the average vital capacity observed was 2.50 liters. From the vital capacities the maximum minute volumes were calculated and the average of these values was found to be 13.79 liters per one-half minute. The average of the observed values was found to be 12.33 liters per one-half minute, giving an average agreement within 10 per cent between calculated and observed values. These results indicate, therefore, that the Sturgis-Peabody formula gives a roughly correct method of predicting the maximal ventilatory capacity of untrained subjects with pulmonary fibrosis and emphysema.

Unfortunately, in dealing with patients who were litigants it was frequently apparent that less than normal effort was exerted. However, fifteen of the litigants apparently cooperated well. The average maximal ventilation per one-half minute for this group was 17.83 liters for the observed values and 18.85 liters for the values calculated from the vital capacity, an average agreement within 6 per cent, with a range from minus 33 to plus 40 per cent.

The correlation coefficient between the percentage of normal vital capacity observed and the percentage of normal maximal ventilation observed was found to be 0.526 ± 0.1349 in twenty-five cases of pulmonary fibrosis, in which the mean value of the former was 66.8 per cent and of the latter 64.6 per cent. The lack of a more perfect correlation between these two values probably depends on the fact that individuals with pulmonary fibrosis attain their maximum respiration with a smaller increase in rate than is the case with normal or with emphysematous subjects. In this series of twenty-five cases the average rate of respiration was 28, a range of from 20 to 32 per minute. If the gross value for ventilation is corrected for dead space and rate of breathing, the effective alveolar ventilation may be obtained. We have reason to believe that when correlations are made on effective alveolar ventilation and the vital capacity a closer relationship will be revealed. With this in view we are continuing our observations, making improvements in the ergometer used and making determinations of the dead space both at rest and during exercise. The dead space is being measured by a new apparatus which permits the taking of eight samples of air from a single expiration, from which the gradient of carbon dioxide or oxygen may be determined. An ergometer is being employed that will permit accurate measurement of the work done.

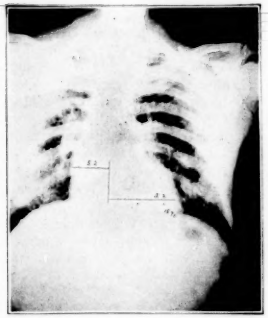


Fig. 5.—Typical of group IV: The total capacity was 75 per cent of normal, vital capacity 70 per cent, and residual air 97 per cent. Ratio RA: TC was 28 per cent. Arterial oxygen saturation was 93.4 per cent.

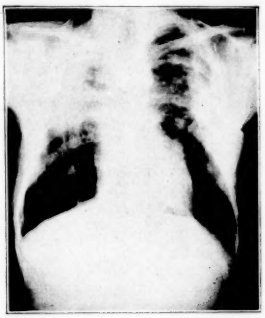


Fig. 6.—Typical of group V: The total capacity was 69 per cent of normal, vital capacity 50 per cent, and residual air 138 per cent. Ratio RA: TC was 44 per cent. Arterial oxygen saturation was 87.3 per cent.

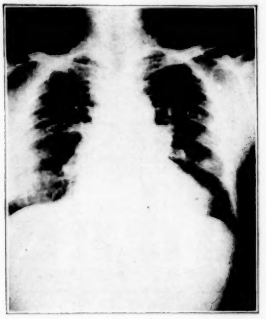


Fig. 7.—Typical of group VI: The total capacity was 59 per cent, vital capacity 39 per cent, residual air 130 per cent of normal. Ratio RA: TC was 48.6 per cent. Arterial oxygen saturation was 71.9 per cent.

SUMMARY

Fifty-three cases of pulmonary fibrosis due to a variety of etiologic factors were studied from the functional point of view in the hope of arriving at an objective and reliable method of estimating the degree of respiratory disability resulting from fibrosis of the lungs. Since the function of respiration is one jointly mediated by the heart, the blood and the lungs, in addition to careful clinical, roentgenographic and electrocardiographic studies, the following observations were made: total pulmonary capacity and its partition between vital capacity and residual air, and the mid capacity; the tidal air, dead space, alveolar gases, and the response of the pulmonary ventilation to exercise; clinical and chemical studies of the blood and of its gas content, particularly with reference to its saturation with oxygen. Since etiologic classification was impossible, the cases were divided into six groups depending on the anatomic type of fibrosis revealed in roentgenograms of the chest.

CONCLUSIONS

1. The comparison of the observed with the normal calculated pulmonary capacity in cases of pulmonary fibrosis indicates that a decrease in the total and vital capacities and an increase in the residual air are characteristic changes in this condition. These changes tend to become more accentuated as the degree of fibrosis increases, but frequent exceptions to this correlation emphasize the fact that one cannot judge accurately the degree of abnormality in pulmonary capacity from roentgenograms alone.

2. The ratio of residual air to total pulmonary capacity is one of great functional significance; the higher the ratio the greater is the tendency to anoxemia. Thus the saturation of the arterial blood with oxygen is less than the normal 94 per cent in every case in which the ratio exceeded 49 per cent, in all but one case in which it exceeded 45 per cent, and in all but four cases in which it exceeded 40 per cent.

3. The Sturgis-Peabody formula for predicting maximal ventilatory capacity from the vital capacity is shown to be roughly correct when applied to cases of pulmonary fibrosis. In a group of twenty-five patients with pulmonary fibrosis, comparison of the percentage of normal vital capacity observed with the percentage

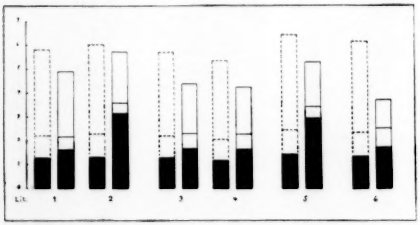


Fig. 8.—Average data of each of the groups I-VI: The left hand column of each pair represents the calculated normal, the right hand one the observed values. The total column is the total capacity, black representing residual air, white the vital capacity. The transverse line represents midcapacity, taken at the end of a normal tidal expiration.

of normal maximal ventilatory capacity predicted by the formula gave a correlation coefficient of 0.526 ± 0.1349, indicating that further work is needed in order to devise a better formula.

4. Patients with pulmonary fibrosis attain maximal ventilation with less acceleration in rate of breathing than in the case of normal subjects or patients with heart disease or emphysema. We are continuing our observations in the belief that a higher correlation between vital and ventilatory capacity will be attained if the effective alveolar ventilation is measured.

260 Crittendon Boulevard.

ABSTRACT OF DISCUSSION

DR. JAMES L. DUBROW, Des Moines, Iowa: Another approach to the problem of estimating the functional disability in the pulmonary fibroses can be made not only through the roentgen film but also by the clinical examination of the patient. Although it is difficult from the chest film alone to say what form of fibrosis a man has, correlation of the clinical with the roentgen observations is of great value. There is a widespread opinion that all forms of pneumonoconiosis are due to silicosis, yet if one examines a large number of films of soft coal miners it will be noted that they present undoubted signs of pulmonary fibrosis. While the miners are able to perform their work, they suffer from a certain grade of dyspnea, and their functional and vital capacity is reduced as shown by Brownlee and his associates in England. In cases of pulmonary fibrosis actually due to silicosis, such as those encountered in granite workers and shown on the x-ray film by nodular mottling, the estimation of functional disability is complicated because many of these cases present pulmonary tuberculosis as an associated disease; but, even ruling out pulmonary tuberculosis as a complicating factor, the vital capacity is more seriously reduced. Another form of pneumonoconiosis in which the degree of functional disability is even greater in the cases that have come under my observation is asbestosis. The fibrosis shown on the roentgenogram in cases of asbestosis differs from that encountered in silicosis in that it is of a finer type and appears softer and more widespread. Clinically, even without seeing the film, one can make a good guess as to the form of fibrosis by the amount of dyspnea the patient displays, always provided the occupational history has been that of an asbestos worker. An interesting point about asbestosis is that of cardiac changes displayed on physical and electrocardiographic examination. The electrocardiogram shows a right ventricular preponderance, and some of the dyspnea noted is in all probability due to myocardial changes incident to the burden on the pulmonary circulation with the gross load being borne by the right heart. In selected cases of pneumonoconiosis reported by me in the *Journal of Radiology* in February I happened to take electrocardiograms in an endeavor to explain the evident dyspnea noted in certain forms of pulmonary fibrosis. The electrocardiographic changes shown in asbestosis seem quite marked.

DR. WILLIAM D. MCNALLY, Chicago: Did you examine any lungs that had cavities, when you gave your vital capacity data? The test would be no good with the cavities, would it?

DR. WILLIAM S. MCCANN, Rochester, N. Y.: No.

DR. MCNALLY: In Gutzeit and Groetschel's work on the vital capacity and respiratory index in pneumonoconiosis, the respiratory index is given as the quotient: the vital capacity divided by height of the body in centimeters (20 in normal human beings).

DR. BENJAMIN GOLDBERG, Chicago: I have found basal metabolic rates as high as plus 55 in patients having a marked interalveolar fibrosis with no evidence of other disease, such as thyrotoxicosis or leukemia. Apparently an anoxemia occurs in these individuals, and the test has been checked several times to make certain of its accuracy. In these instances one must also consider the possibility of an increase in physical effort, associated with the dyspnea produced by the disease, as a factor in increased metabolism.

DR. WILLIAM S. MCCANN, Rochester, N. Y.: With regard to the estimation of the degree of functional impairment from the actual test alone, in the first group of patients the average observations of which were rather close to normal, quite a number were workmen between the ages of 40 and 60 who had evidence of myocardial disease (abnormal electrocardiograms). One would expect to encounter arteriosclerotic and hypertensive heart disease frequently in this age group. On the other hand, we had a considerable number of people who had abnormal electrocardiograms, who did fairly well with regard to functional capacity, and it all depended, I suppose, on the amount of cardiac reserve they had left in spite of electrocardiographic abnormalities. The high incidence of cardiovascular disease in this age group makes it a bit unfair to compare such a group with normal men of a more youthful type, as we have done. We hope soon to have "normal" standards for men between the ages of 40 and 60, selected for apparent health and from nondusty occupations. None of these patients had cavities that we could demonstrate by x-rays. There may be small cavities in some of them, but they were not obvious. We were not dealing very much with the tuberculous group of pneumonoconioses. We have not done anything with the formula of which Dr. McNally spoke. I was not even aware of it. In regard to basal metabolism, there is one thing which I think should be borne in mind. Some of our patients had an arterial oxygen saturation as low as 70 per cent. If the basal metabolism is determined with a closed system, using a rich oxygen mixture, the absorption of oxygen there does not necessarily mean the use of that oxygen in

V 19

metabolism. It means in many cases building up the oxygen saturation of the arterial blood during the period of the test. It is impossible to get a true determination of the basal metabolism of a cardiac patient who is severely anoxemic, or of one with pulmonary fibrosis, who is severely anoxemic, by the use of a closed apparatus such as the Benedict. On the other hand, if the metabolism is determined by means of a Tissot spirometer that factor does not enter in. The oxygen absorption is necessarily determined in the Christie method of determining the residual air. We did not calculate the metabolism from the oxygen absorbed because we believed that a part of it was used in building up the oxygen saturation of the blood.

DR. E. R. HAYHURST, Columbus, Ohio: Did you make any breath-holding tests?

DR. MCCANN: No.

CONGENITAL CYSTIC DISEASE OF THE LUNGS

A CLINICAL STUDY

HARRY G. WOOD, M.D.
ROCHESTER, MINN.

In a review of the literature, I am unable to find a report of any case of congenital cystic disease of the lungs diagnosed clinically before 1925. In that year, Koontz [1] reported a case and was able to collect 108 other cases. These were all from the European literature and all were based on material obtained at necropsy. This article is to a large extent responsible for the increased interest in, and increased clinical knowledge of, the condition existing today. Since the time this paper was published, I have been able, from the American and English literature, to collect twenty-three reports of cases exclusive of those reported in this series. I presume there are more. Of the twenty-three cases, a clinical diagnosis was made in sixteen and a diagnosis based on material obtained at necropsy in seven. In one case, the clinical diagnosis was confirmed at necropsy.

Some authors have attempted a classification based on the histopathologic observations. In a general way, all cases fall into two groups: (1) those in which there are single or multiple, large cysts containing air or fluid, and (2) diffuse degeneration resulting in the so-called honeycomb type of lung.

The congenital origin of this disease is still a matter of contention, but in many cases the lesions are palpably present at birth and, more important still, in specimens obtained in later life, pigment is absent almost invariably. These facts seem satisfactorily to settle this question.

Theories advanced to explain the condition have been many. Koontz concluded, however, that conjectures as to the cause only beclouded the issue, and that no simple mechanical explanation is available for what is manifestly a developmental anomaly of which many of the factors are unknown.

MATERIAL

This paper is based on sixteen cases observed at the Mayo Clinic. They have been divided into three groups. Group 1 is composed of six cases in which the diagnosis appears to be incontrovertible. Group 2 is composed of six cases in which the diagnosis is based entirely on the roentgenologic observations. I believe that a majority of all cases of congenital cystic degeneration can be satisfactorily diagnosed from such observations. Group 3 is composed of four cases that are atypical. In these the diagnosis may be disputed, but careful consideration of the histories and clinical and roentgenologic changes leads us at the clinic to the belief that they are also true examples of congenital cystic degeneration of the lung. This group is included to show that there is a certain group of cases that cannot be diagnosed with certainty.

REPORT OF CASES IN GROUP 1

CASE 1.—A man, aged 36, was examined at the clinic, March 15, 1932. Tuberculosis had not occurred in the family, and the family history otherwise was unimportant. The patient had had influenza in 1918 but had been healthy otherwise until the illness of which he complained. This illness had begun insidiously two years before his examination, without acute infection. Dyspnea gradually had increased and there was occasional palpitation that was worse on exertion. The man had been unable to work for six months previous to his examination. He had not lost weight and he had not had fever. His appetite and digestion were good. There was some cough for one year. When lying on his left side he raised blood-tinged sputum, and dyspnea was increased. A previous diagnosis had been spontaneous pneumothorax. Repeated aspirations (from fifteen to eighteen times) of air did not relieve the condition.

Examination disclosed emphysema on the left side. The temperature was 99.6 F., the pulse rate 93 beats per minute, the blood pressure 118 mm. of mercury systolic and 86 diastolic. The concentration of hemoglobin was 17.5 mg. per hundred cubic centimeters; erythrocytes numbered 5,170,000 and leukocytes 6,100 per cubic millimeter of blood. The sputum was negative for bacilli of tuberculosis. Breath sounds, vocal resonance and vocal fremitus were diminished on the right side. The heart was displaced to the left. The right side of the diaphragm and the liver were displaced downward. Succussion sounds, tinkle, and amphoric breathing were absent, and the coin test was negative. On study of intrapleural pressure, the original reading was from $+6$ to $+1$. After withdrawal of 500 cc. of air the reading was from $+3$ to -1.

The roentgenologist made a diagnosis of congenital cystic disease of the lung. A roentgenogram disclosed cystic destruction of the entire right lung (fig. 1), a small amount of fluid at the base of the right lung, and a small cyst at the hilus of the left lung. Bronchoscopic examination disclosed that the trachea was pushed to the left; the lumen of the right main bronchus was slightly narrowed and was collapsible with respiration. A small amount of blood was seen coming from the bronchus of the lower lobe of the right lung. Roentgenograms after injection of iodized poppy-seed oil disclosed an advanced cystic condition of the entire right lung (fig. 2).

No treatment other than restriction of activities was advised.

CASE 2.—A girl, aged 5 years and 4 months, was examined in February 1924. The family history was unimportant; there was no tuberculosis in the family. Birth had been normal. The child supposedly had had mild influenza in the third month of life and bronchitis at 18 months, but she had been considered to be robust and healthy until she had reached the age of 3 years. After her third birthday she had begun to have recurring attacks of nausea and vomiting, with fever. Tonsillar infection had been found and the tonsils and adenoids had been removed in March 1921. The patient had remained well and had gained weight and strength for six months. In November 1921, however, she progressively had lost weight and strength, had had marked anorexia and gradually but steadily had become more dyspneic on exertion. This condition had persisted for one year, without pain, elevation of temperature, sweats or cyanosis. In December 1923, because of mild respiratory infection and cough for one week, she had been taken to her physician, who had made a diagnosis of spontane-

From the Division of Medicine, the Mayo Clinic.
Because of lack of space, this article is abbreviated in THE JOURNAL. The complete article appears in the author's reprints.
Read before the Section on Practice of Medicine at the Eighty-Fifth Annual Session of the American Medical Association, Cleveland, June 13, 1934.

1. Koontz, A. R.: Congenital Cysts of the Lung, Bull. Johns Hopkins Hosp. **37**: 340-361 (Nov.) 1925.

ous pneumothorax of the right side. Air had been aspirated eight or nine times from the right side of the thorax, supposedly from the right pleural space, without relief.

When the patient was examined at the clinic in 1924, her pulse rate was 118 beats per minute, respirations were 45 per minute and breathing was labored, but cyanosis was absent. The temperature was normal. The physical signs were those of pneumothorax of the right side. The roentgenologic report was that the right lung was completely collapsed and the heart displaced to the left. The value for hemoglobin was 68 per cent; erythrocytes numbered 4,010,000 and leukocytes 12,400 per cubic millimeter of blood. Urinalysis gave negative results and the Wassermann reaction of the blood and the Pirquet test were negative. Air was aspirated on three occasions. The first time, a positive water pressure of from 24 to 32 cm. was present; the pressure became atmospheric after aspiration of 550 cc. of air. At the time of the second aspiration, a negative pressure of from 2 to 4 cm. was found; it became positive when the child cried. At the third aspiration, a positive pressure of 20 cm. was found, and exploration of the thorax was carried out. The surgeon's report is as follows: A filmy, transparent membrane was seen beneath the parietal pleura. When it was incised an empty right thoracic cavity was found, with no trace of pulmonary tissue. When the cavity was partially filled with saline solution, at two points near the hilus some bubbling was seen, which soon ceased. These areas were lightly touched with a cautery and the incision was closed. The patient's convalescence was successful, with some formation of fluid, which was aspirated once. Even after exploration the correct diagnosis was not recognized, and the surgeon's opinion was that he was dealing with a condition of congenital absence of the right lung. A postoperative roentgenogram was made (fig. 3*A*).

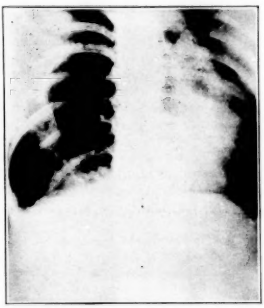


Fig. 1 (case 1).—Cystic changes involving the entire right lung. The heart and mediastinum are displaced to the left.

For the subsequent history, pathologic changes and recent thoracic roentgenogram (fig. 3*B*), I am indebted to Dr. Birnberg, to whose care the patient was returned after operation. From 1924 until February 1934, the girl developed normally, without acute illness except for one attack of what was probably acute appendicitis. There was always moderate dyspnea on exertion but otherwise she was fairly healthy. She became acutely ill, Feb. 1, 1934, with inflammatory abdominal disease, and was admitted to the hospital, February 5, where immediate laparotomy was performed. Generalized peritonitis was found and the patient succumbed five days later.

At the time of this illness, the right side of the thorax was more prominent than the left, it gave a tympanitic percussion note, breath sounds were distant, and fremitus was absent. The heart was displaced to the left. There were negative physical changes on the left.

At necropsy, the observations were as follows: A large, air-containing cyst filled the right side of the thorax and was adherent to the thoracic wall and diaphragm. This remained inflated when the sternum was removed. The cyst herniated across the superior mediastinum, extending well into the apex of the left pleural cavity. The cyst was found to be filled with filmy strands, like cobwebs. The left pleural cavity was empty, and the left lung was composed of three lobes. Throughout the lower lobe and lower portion of the upper lobe were numerous small areas of pneumonic consolidation. The treachea was opened and water was injected. The water did not enter the large cyst but infiltrated the right lung and wall of the cyst in the region of the apex and filled the portion of the cyst that was in the left side of the thorax.

This explanation makes me feel that in reality we were dealing with a second cyst occupying the superior mediastinum and upper left part of the thoracic cavity, rather than a portion of the large cyst herniating across.

CASE 3.—A married woman, aged 37, was referred to the clinic in June 1926 by Col. J. A. Wilson[2] after complete investigation and with a diagnosis of emphysematous cyst of the upper lobe of the left lung. This case has been reported by Colonel Wilson, who apparently was the first to induce pneumothorax for diagnosis in this condition.

On examination at the clinic, the physical changes were those of pneumothorax involving the left side. The mediastinal structures and heart were displaced to the right. We repeated Colonel Wilson's diagnostic procedure and induced pneumothorax. This clearly demonstrated the wall of the partially collapsed cyst.

CASE 4.—A boy, aged 2 years and 4 months, was examined in November 1928. There was no history of tuberculosis in the family and the family history otherwise was unimportant. Birth had been normal, and the child had seemed normal and healthy until 18 months of age. He then had had what had been diagnosed as "stomach flu," and following this gradually had lost weight and strength, although definite pulmonary symptoms had not been noted. When 22 months old, the child had had an elevated temperature, and his mother had noted that respirations were peculiar and difficult. A physician had been called, who stated that examination then had revealed a hyperresonant note over the right side of the thorax, both anterior and posterior, with almost no breath sounds, and roentgenologic examination had given evidence of what had been assumed to be pneumothorax involving the right side. The physician had aspirated air from the right side of the thorax without giving any subjective relief. As a matter of fact, the child seemed more distressed than before aspiration. The physician sent us a roentgenogram taken a few days later, which he described as follows:

"This shows what we believed to be a stripping loose of the pleura, probably as a result of the puncture; air getting behind the needle hole and stripping the pleura away from the chest wall. This rapidly fell back into its normal position."

The diagnosis can be made with certainty on the basis of this report. This picture is identical with that produced in case 2 after thoracotomy, and in case 3 after injection of air into the pleural cavity, and must have been caused by an induced pneumothorax forcing the wall of the cyst away from the thoracic wall.

CASE 5.—A married woman, aged 19, was examined in October 1928. Her case has been reported by Harrington.[3] A diagnosis of intrathoracic tumor of indeterminate etiology was made, and a large cystic tumor was removed by the transpleural route. The pathologic report was as follows: Fibrous-walled cyst, filled with clotted blood: one portion composed of salivary gland tissue. There were columnar epithelial-lined ducts and fibrous tubes with lining cells closely resembling bronchial epithelium. A recent review of this specimen showed that there was complete absence of pigment. The pathologic changes warrant the diagnosis of congenital pulmonary cyst.

One year after operation the patient was reported as being alive, well and able to work every day.

CASE 6.—Harrington[4] has reported this case of a married woman, aged 37. A diagnosis of infected cystic tumor of the right lung was made. Jan. 16, 1932, a large cystic mass containing about 750 cc. of pus was removed, and a bronchial fistula communicating with the cyst was closed.

On pathologic examination of the specimen the wall of the cyst was found to be lined by epithelium and contained car-

2. Wilson, J. A.: Obstructive Emphysema: A Case Report, Am. J. Roentgenol. **17**: 432-436 (April) 1927.

3. Harrington, S. W.: Surgical Treatment of Intrathoracic Tumors, Arch. Surg. **19**: 1679-1725 (Dec.) 1929.

4. Harrington, S. W.: Surgical Treatment of Mediastinal Tumors: Removal of Cystic Azygos Lobe from Posterior Mediastinum, Ann. Surg. **96**: 843-856 (Nov.) 1932.

tilage and all types of pulmonary tissue. Complete absence of pigment was also noted when the specimen recently was reexamined.

In September 1933 the patient was reported to be in good health.

REPORT OF CASES IN GROUP 2

CASE 7.—A man, aged 43, when first examined at the clinic in 1923 complained chiefly of functional disorders. Examination of the thorax gave essentially negative results. The value for hemoglobin (acid hematin method) was 117 per cent. Erythrocytes numbered 4,980,000 per cubic millimeter of blood. The Wassermann reaction of the blood was negative. Examination of the sputum gave negative results. The roentgenologists reported bronchial thickening in the upper lobe of the right lung.

Fig. 2 (case 1).—Roentgenogram made after injection of iodized oil. The patient is in the lateral position. The fluid level in the cyst is evident.

The patient returned in January 1934 because of "crusting of the right cheek" for a year or more, and the history which particularly concerns the changes relative to this paper will be given now: Both parents had had carcinoma. The patient had had whooping cough and pneumonia when 4 years of age. He stated that he had always been delicate and short winded and never had been able to work or exercise as hard as his companions. He had had two attacks of pneumonia, with pleurisy, at the age of 21. At the age of 31 he had had elevated temperature, had lost weight and had had some hemoptysis. He had remained in a sanatorium for three months and stated that his sputum had been positive for bacilli of tuberculosis. He had had severe influenza when he was 39 and had always had frequent respiratory infections. However, there had been little cough or expectoration in recent years.

His finger tips were moderately cyanosed. The value for hemoglobin was 17.5 mg. per hundred cubic centimeters of blood; erythrocytes numbered 4,730,000 and leukocytes 8,500 per cubic millimeter of blood. The lungs were emphysematous, there were changeable areas of diminished breath sounds over the right lower lobe, and occasional rhonchi were heard. The roentgenogram disclosed multiple annular shadows throughout both lower pulmonary fields, more marked on the right. There were also miliary calcified lesions scattered throughout the left lung (fig. 4). The roentgenologist's diagnosis was multiple congenital, pulmonary cysts. The cutaneous lesion of which the patient complained was diagnosed as keratosis.

The man was, and had been for many years, definitely dyspneic, but he was not at all worried about this or interested in the pulmonary examination. Further investigation did not seem warranted.

The most remarkable fact about this case is that an individual who had had pulmonary tuberculosis, repeated pneumonia, many acute respiratory infections, and apparently secondary cystic infection, with progressive destruction of pulmonary tissues, did not have increasing disability.

The other five cases in this group will be reported more briefly.

CASE 8.—A man, aged 29, was examined at the clinic in June 1933. There was no tuberculosis in the family and otherwise the family history was unimportant. The patient had had measles and whooping cough as a child, influenza at the age of 19 years, and questionable pleurisy three years previous to his examination at the clinic. Five and two years before, for a period of three or four weeks, there had been moderate cough and expectoration but never hemoptysis. No other history of respiratory infection was obtainable.

The patient had been in good general health until five years before examination, and until then he had been able to participate in any form of active sport. At that time he had begun to experience dyspnea on exertion. This had been constant thereafter and had steadily increased in severity. At the time of his examination he had been able to walk slowly for a considerable distance but not more than two blocks rapidly.

On examination, rather marked pulmonary emphysema was noted. No sputum was obtainable. The roentgenologist's diagnosis was congenital polycystic degeneration of the lungs (fig. 5).

CASE 9.—A man, aged 39, examined in November 1932 came to the clinic because of backache and made no complaints referable to the lungs. There was no history of tuberculosis in the family, and the family history otherwise was unimportant. The patient had had influenza in 1918 but no other acute illness. He had moderate palpitation on exertion. His history otherwise was essentially negative.

The observations made on examination were retraction and lagging of the left upper part of the thorax, with diminished vocal fremitus, diminished resonance and diminished breath sounds over the same area. The heart was displaced to the right. The roentgenologic report read as follows: absence of pulmonary structure of the left upper lobe, heart displaced to the right, cystic degeneration of the left lower lobe and of the region of the right hilus.

In the absence of all pulmonary symptoms, further investigation did not seem warranted.

CASE 10.—A man, aged 38, was examined in February 1932. There was no history of tuberculosis in the family, and otherwise the family history was unimportant. The patient made many complaints. He was a heavy smoker. He stated, also, that he had had cough, palpitation and dyspnea on exertion for years but did not regard this as important.

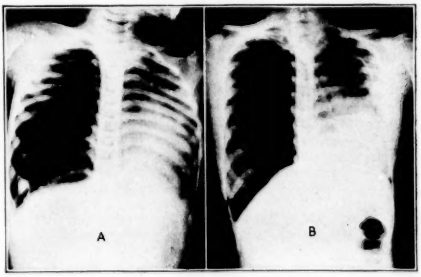


Fig. 3 (case 2).—*A*, appearance in 1924, after thoracotomy. The outline of a balloon cyst, partially collapsed as a result of induced pneumothorax, is evident. The heart and mediastinum are displaced to the left. *B*, appearance in 1934; a large cyst fills the entire right side of the thorax, and a second, smaller cyst is in the upper left portion of the thorax.

On physical examination, the observations referable to the thorax were essentially negative. Evidences of achlorhydria, pyuria, prostatitis, dental sepsis and tonsillar infection were discovered. The normal pulmonary markings were absent in the area of the right upper lobe and the pulmonary margin could not be defined. The roentgenologist made a diagnosis of congenital cystic degeneration.

The patient did not care to submit to the bronchoscopic investigation that was suggested. Accordingly, reduction in

smoking, with a better regimen of life, and elimination of foci were advised.

REPORTS OF CASES IN GROUP 3

CASE 13.—A girl, aged 10 years, was examined at the Mayo Clinic, Jan. 5, 1931. The family history was unimportant; there was no history of tuberculosis. The patient had had measles and mumps and supposedly had had pneumonia at the age of 7 years, followed by left empyema, resection of a rib, and drainage. She had made a good recovery. Two months previous to her examination at the clinic, cervical adenitis had been cleared up following actinotherapy. For one month she had been dyspneic on exertion. Four severe attacks had come at bedtime, after playing with her younger brother, and had consisted of severe dyspnea and cyanosis. At the onset of an attack she would scream and say she was choking. She had fallen to the floor on one or two occasions. The attacks had lasted for from forty-five to sixty minutes. She would be very tired the following day but well otherwise. She had a good appetite and digestion.

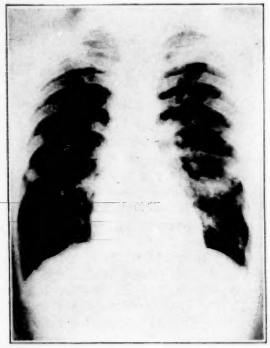


Fig. 4 (case 7).—Old, calcified tuberculous lesions in both pulmonary fields, with multiple cysts throughout the lower two thirds of the right lung. The outline of one cyst shows particularly well.

Examination disclosed a scar of old empyema drainage in the left axilla, and physical examination of the lungs gave essentially negative results. Roentgenograms disclosed partial collapse of the upper lobe of the left lung, with thickening of the interlobar and mediastinal pleura (fig. 6). A roentgenogram made three days later disclosed some expansion of the collapsed portion. The patient's temperature was 99 F., her pulse rate 108 beats per minute and her blood pressure 110 mm. of mercury systolic and 78 diastolic. The value for hemoglobin was 10.9 mg. per hundred cubic centimeters and there were 8,500 leukocytes per cubic millimeter of blood. The Pirquet test was negative; the Wassermann reaction of the blood was negative, and there was no sputum for examination.

Restriction of activities was advised, and a report received fifteen months later stated that the patient had had no further attacks of dyspnea and cyanosis. She had gained 20 pounds (9 Kg.) and appeared to be in good health. Information has not been obtained during the past year, and further roentgenograms have not been obtainable.

Although the diagnosis made at the time of examination was spontaneous pneumothorax, review of the history and examinations, in my opinion, warrants a diagnosis of solitary congenital cyst of the upper lobe of the left lung. It would seem that the explanation of cessation of attacks and subsequent good health was that an imperfect communication of the bronchus with the cyst had become completely closed, without gross infection occurring.

CASE 14.—A man, aged 20, was examined first in May 1930. There was no history of tuberculosis in the family and otherwise the family history was unimportant. The patient was healthy, did all kinds of farm work and had no severe illnesses until the age of 19 years. He had pneumonia in August 1930. Convalescence was normal and he remained in good health until April 1931. At this time, an acute respiratory infection developed, with general malaise, elevated temperature, cough and expectoration, and a few days later he had a pulmonary hemorrhage. After this he felt better, but he returned to the clinic for examination ten days later.

At this time, roentgenologic study revealed dense infiltration of the lower lobe of the right lung, with a fluid level, and a diagnosis of pulmonary abscess was made (fig. 7*A*). The bronchoscopic examination gave negative results. The patient lived near the clinic and returned at frequent intervals. The urine was normal and the Wassermann reaction of the blood was negative. Repeated blood counts were normal, and many examinations of sputum failed to reveal bacilli of tuberculosis. In the period from May 1931 until February 1933 the patient was able to work and remained in fairly good health except for two episodes: In July 1931, for one month, there was general malaise and weakness, and some rather foul expectoration. In December 1931, after violent exertion and chilling, there was general malaise, pain in the right side of the thorax, painful respirations, and some night sweats. Physical examination at this time revealed signs of moderate effusion at the base of the right lung. These physical signs and symptoms gradually subsided, and in about a month the patient had regained his former health. Repeated roentgenologic examinations gave little evidence of change (fig. 7*B*), and the diagnosis made was either pulmonary abscess or cystic tumor of the middle lobe. Because of the similarity in the history and progress of this case to the history and progress in case 6, Dr. Vinson suggested that we were dealing with a congenital cyst of the right lung, probably of the middle lobe, and in February 1933, on bronchoscopic examination, a small amount of pus was seen exuding from the bronchus to the right middle lobe. Iodized poppy-seed oil was injected and entered the cyst, after which roentgenograms were made which the roentgenologists reported as giving evidence of cystic tumor of the right middle lobe. Since the iodized oil has been injected, the patient subjectively has felt remarkably well and has been able to work every day. However, I do not feel that this marked subjective improvement can be explained entirely on the basis of the injection of the iodized oil.

I believe that this case is an example of a congenital cyst which was filled with fluid; the patient remained free from symptoms until after an acute respiratory infection in April 1931, at which time infection of the content of the cyst occurred. Surgical removal of the cyst in this case should be considered, if evidence of infection and constitutional manifestations are progressive, but is not warranted so long as the patient remains free of symptoms, as at present.

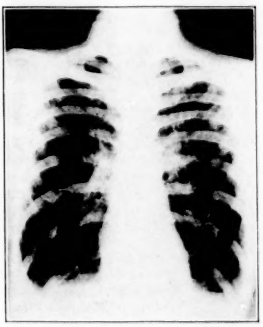


Fig. 5 (case 8).—Diffuse, cystic changes throughout both pulmonary fields.

CASE 15.—A girl, aged 1 year and 3 months, was examined in December 1931. When she was 7 months old right otitis media developed, and a diagnosis of tuberculous otitis media was made. She had seemed healthy in every other way. The Mantoux test was positive in a dilution of 1:200. Physical examination and laboratory tests otherwise gave essentially negative results. The roentgenologist reported a localized area of increased density in the right upper lobe, suggesting a cyst and calcified hilar glands. A diagnosis of probable congenital cyst was made.

The possibility that we were dealing with a tuberculous pulmonary lesion was considered, but the roent-

genologic observations were not suggestive of such a condition, and the positive Mantoux reaction is explainable on the basis of the otologic changes. In the absence of all pulmonary symptoms, the lesion that most satisfactorily explains the roentgenologic changes would be congenital pulmonary cyst. It is fair to assume that we were dealing with a solitary cyst of the left upper lobe, containing fluid and without bronchial communication; also, it can be assumed that there is no infection of the contents of the cyst. Further examination in this case is to be desired. Unchanged roentgenologic changes would do much to confirm the diagnosis.

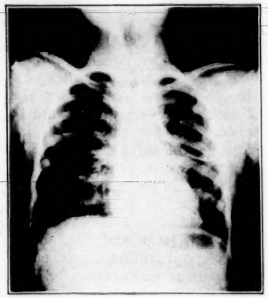


Fig. 6 (case 13).—Large, solitary cyst of the upper lobe of the left lung.

CASE 16.—A youth, aged 19, was examined in June 1932. He had had three febrile attacks, diagnosed as pleurisy, the first at the age of 6 years, the second when he was 16, and the third in January 1932, which had begun with acute tonsillitis. Aside from these illnesses, the patient's general health always had been good. Since the illness in January 1932 he had never been well. Cough had developed, with creamy, purulent secretion, occasionally blood tinged, and on two occasions, in May and July, there had been a profuse pulmonary hemorrhage.

Physical examination of the thorax gave essentially negative results. Many roentgenologic examinations were made, which sometimes disclosed a dense, somewhat circular, shadow in the right upper lobe, and at other times a fluid level was manifest. The right upper part of the thorax, posteriorly, was explored November 26. While the patient was going under the anesthetic he coughed up a very large amount of purulent material. The abscess, or cyst, was found to be collapsed and could not be removed surgically. It was entirely in the substance of the right upper lobe. Bronchoscopy was performed on two occasions in April 1933, and purulent material was again seen to exude from the opening near the bronchus to the right upper lobe. Iodized poppy-seed oil, 15 cc., was injected. The patient was again subjected to bronchoscopy September 15, and no pus could be seen. He had gained weight, had practically no cough or expectoration, was feeling very well, and had been able to work all summer.

The first diagnosis made was pulmonary abscess or cyst and later infected cyst of the right upper lobe. The possibility of its being an infected dermoid was considered, but there was never any evidence of hair in the secretion, and the marked improvement that followed spontaneous emptying of the cyst and injection of iodized oil makes me feel that it was, in all probability, a congenital cyst, asymptomatic until secondary infection occurred.

COMMENT

The experience related in this paper differs from that previously given. In this series, the lesions were wholly or chiefly limited to the right side of the thorax in eight cases and to the left in five. In three the lesions were bilateral and of the honeycomb type. In three of the others in which the lesions were chiefly unilateral, there was evidence of bilateral involvement. I believe that these variations are not of importance. It is probable that opportunity to make an anatomic examination in all cases would considerably increase the percentage of cases in which bilateral lesions are demonstrable. In the series here reported, ten patients were males and six were females. Of the thirteen cases in which the lesions were chiefly unilateral, the cysts contained fluid in five, and contained air in eight. In all cases the Wassermann reaction was negative and a history suggestive of syphilis was not obtained in any case. There was evidence of old, healed tuberculosis in one case and of tuberculous otitis media in another. Both tuberculosis and syphilis seemingly can be ruled out as etiologic factors. Thirteen patients came to the clinic with complaints associated with the pulmonary lesions, but in three the pulmonary lesions were purely incidental.

Symptoms.—Extensive lesions may be present with very few, or with no, symptoms. The clinical manifestations vary greatly and depend chiefly on the extent of the lesions, on their site, and on whether there is a change in intrathoracic pressure. There is no syndrome on the basis of which a clinical diagnosis can be made, but the history is nevertheless extremely important and in many instances should lead to a strong suspicion that pulmonary cystic degeneration will be found. Most characteristic of all is a history, obtained particularly with reference to infants and children, of recurring attacks of severe dyspnea with cyanosis. Such a syndrome should make one suspect that one is dealing with a pulmonary cyst under increased pressure. Miller[6] reported the first case of which I have been able to find a report in which a clinical diagnosis of congenital cystic lung was made. This case was characterized by attacks which the author ascribed to secondary spontaneous pneumothorax. Cautley,[7] however, in 1924 reported a similar case, with necropsy, and suggested the possibility that the dyspneic attacks occurred when air could enter the cyst through a valvelike opening, without equally free egress resulting in increased intrathoracic pressure. Eloesser agreed with this and stated

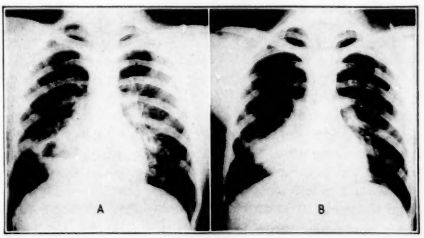


Fig. 7 (case 14).—*A*, large cyst at the right hilus with a fluid level in the cyst; *B*, the same cyst, two and a half years later, filled with fluid.

that such attacks occurred only when an imperfect bronchial communication existed and would be absent when either a free communication or no communication at all existed. This explanation is most logical and is unquestionably correct.

When progressive dyspnea develops in adults, without apparent cause, and with or without a preceding respiratory infection, the possibility of congenital cystic degeneration of the lungs should be considered.

6. Miller, R. T. Jr.: Congenital Cystic Lung, Arch. Surg. **12**: 392-405 (Jan.) 1926.
7. Cautley, E.: A Cystic Malformation of the Lung, Brit. J. Child. Dis. **21**: 138-140 (April-June) 1924.

Dyspnea is the most constant subjective complaint and in our series was present in eleven cases. In eight it was severe. Cough was present in seven cases, but in only four was there any considerable amount of sputum. Cyanosis was noted in only one case but probably was at times present in several others. Severe palpitation was a complaint in two cases. In only three cases was there any pain. In two cases there was brisk pulmonary hemorrhage, and in one there was slight hemoptysis.

The heart and mediastinal structures were markedly displaced to the side opposite the lesion in five cases. Several cases in which the reverse was true have been reported, but theoretically, with increased intrathoracic pressure, the displacement should be away from the lesion unless the mediastinum is fixed by previous inflammatory disease. The reverse is true in the presence of massive atelectasis; in this, the mechanics of production necessitate the drawing of the surrounding structures toward the lesion.

Diagnosis.—In all cases, with all types of lesions, satisfactory roentgenologic study is a necessity in making a diagnosis of congenital cystic disease of the lungs. In many instances bronchoscopic examination, injection of opaque substances, and induction of pneumothorax may be necessary in addition. The various conditions that must be distinguished from it depend largely on the type of cystic degeneration present. With fluid-containing cysts, the lesions that offer most difficulty in differential diagnosis are (1) thoracic tumor, (2) pulmonary abscess, (3) empyema, (4) dermoid cyst and (5) echinococcus cyst.

The discharge of cystic secretion may at times aid in the diagnosis, but if a cyst, filled with fluid, has no bronchial communication and is lacking a fluid level, it may be impossible to distinguish it from a solid tumor. In such a case, the true nature of the lesion can be determined only by exploratory thoracotomy.

A cyst (particularly if a fluid level is present) may have the same appearance roentgenologically as a pulmonary abscess. The character of the secretion may aid in differential diagnosis, but secondary infection of the content of the cyst frequently occurs, and purulent secretion from a cyst may be indistinguishable from secretion from an abscess. In such an instance, bronchoscopic examination and injection of iodized oil may allow the two to be distinguished. A pulmonary abscess nearly always undergoes regression or progression, whereas the appearance of a pulmonary cyst probably will remain unchanged over a long period. This fact may be a diagnostic aid. Cysts have at times been mistaken for evidences of localized empyema. A few have been reported in which the diagnosis was made only following thoracotomy.

Eloesser mentioned the fact that in empyema of this type the roentgenographic shadow is wedge shaped, with the base against the thoracic wall. In a case of pulmonary cyst, this is not so. The shadow may be circular or rectangular.

It may be impossible to distinguish a dermoid from a congenital cyst, unless teeth, bone or cartilage can be demonstrated roentgenologically, or unless hair is found in the secretion. Either finding would, of course, confirm a diagnosis of dermoid. A number of cases of echinococcus pulmonary cyst have been reported in which it was impossible to make a roentgenologic differential diagnosis from congenital cyst. They can be easily distinguished, however, by a complement fixation test. In cases of ecchinococcus cyst, also, urticaria is frequent and eosinophilia will be found.

In considering air-containing cysts, the diagnostic problem is different. Bronchiectasis at times may give a history and produce roentgenologic changes not unlike those of honeycomb lung, but otherwise almost the only lesion that can be mistaken for congenital cyst of the lung is spontaneous pneumothorax. If the differential diagnosis is between bronchiectasis or congenital cystic degeneration, bronchoscopic examination and injection of iodized oil generally will show which is present.

In cases in which there are fluid-containing cysts or honeycomb lungs, physical examinations are of little or no diagnostic value. In cases in which there are large balloon cysts, routine physical examinations will give results identical with those in cases in which spontaneous pneumothorax exists. However, in spontaneous pneumothorax, a well defined outline of the margin of the collapsed lung should be visible, and in cystic degeneration it is not.

Pollock and Marvin stressed the point that the walls of air-containing cysts appear roentgenologically as curving, linear shadows, whereas in pneumothorax with associated pleural adhesions the linear shadows are straight. If a bronchial communication exists, injection of iodized oil generally demonstrates successfully the outlines of the cyst. If no communication exists, however, a large balloon cyst can in some instances be differentiated from pneumothorax only by injecting air into the pleural cavity. The resulting roentgenogram, showing the outline of the partially collapsed cyst forced away from the thoracic wall, is absolutely diagnostic. I believe that Colonel Wilson was the first to employ this diagnostic measure. At the clinic we repeated the procedure in his case, and it was of value in two other cases in our series.

Treatment.—Some observers have reported improvement following bronchoscopic aspiration followed by injection of iodized oil. A few other observers have reported cures following extirpation of a fluid-containing cyst. In two cases of our series, Harrington removed such cysts with apparent cure of the disease.

In two cases in which there were infected cysts communicating with a bronchus, marked subjective improvement followed bronchoscopic aspiration and injection of iodized oil. A third such case became asymptomatic following spontaneous rupture and evacuation of the cyst.

In one case, characterized by recurring attacks of cyanosis and dyspnea, the attacks subsided, presumably as a result of complete bronchial occlusion having occurred spontaneously. In one case, the patient remained in good health for ten years following thoracotomy, at which time the bronchial orifices were cauterized. This procedure appears to have resulted in complete bronchial occlusion.

In three cases, few or no symptoms resulted from the cystic pulmonary changes, and in six cases the symptoms were progressive, and no attempts at treatment were instituted.

In most of the cases that have been reported, which were characterized by increased intrathoracic pressure (dyspnea and cyanosis), repeated aspirations or the institution of permanent thoracic drainage was necessary as a life-saving measure. In three of our series, and in the other cases reported in the literature, in which increased intrathoracic pressure did not occur, benefit was not derived from aspiration of air from the thoracic cavity.

SUMMARY AND CONCLUSIONS

Congenital cystic degeneration of the lungs is an uncommon disease, but it occurs much more frequently than has been suspected. With modern diagnostic methods, a roentgenologic diagnosis should be made in a high percentage of cases. Secondary pulmonary infection is the greatest potential danger to which the patients are subjected. Patients who have no bronchial communication are safer, and the disease is less likely to progress than if such a communication exists. In cases in which there is a bronchial communication an attempt to produce complete bronchial occlusion is a proper procedure. Complete extirpation of fluid-containing cysts has given excellent results in a number of cases. A number of patients who had infected cysts, with bronchial communications, have been greatly benefited by bronchoscopic aspiration followed by injection of iodized poppy-seed oil. This treatment should be considered in cases of this sort. Diffuse, bilateral cystic degeneration of the so-called honeycomb type is not benefited by any form of treatment.

ABSTRACT OF DISCUSSION

DR. L. J. MOORMAN, Oklahoma City: This condition is more common than is realized. Dr. Wood has made obvious the wide variation of symptoms and the pathologic changes. These variations suggest grave diagnostic difficulties. The picture as visualized through the history, the physical examination and the roentgen and bronchoscopic observations is often colored by secondary infections and various postnatal respiratory influences, especially variations in intrathoracic pressure. If the cysts do not communicate with the bronchi, or if there is free communication without secondary infection, there may be no symptomatic evidence of the disease. If the cysts and the bronchi communicate, with valvelike constrictions at the point of communication, distressing and even fatal dyspnea and cyanosis may develop. In other cases escaping early fatal intrathoracic pressure the symptoms may range from those of a mild bronchitis to those found in cases of advanced pulmonary tuberculosis or in nontuberculous suppurative pulmonary infections. With such a marked variation in clinical and pathologic manifestations, one may expect the physical signs to cover a correspondingly wide range. Roentgen studies present similar diagnostic difficulties. The existence of cough, dyspnea and cyanosis from the time of birth or for at least a period of years, with a history of periodic exacerbations of respiratory symptoms and signs, should lead one to suspect the presence of this condition. Repeated sputum examinations negative for tubercle bacilli support this suspicion. Such a history, supplemented by a careful physical examination, should enable one to eliminate the various pulmonary conditions that may be confused with this disease. A careful study of good stereo x-ray films may be the final diagnostic stroke. In case polycystic disease is present, even though there may be areas of opacity as a result of atelectasis and associated infection, the films may reveal a designless network with graceful lines falling across large areas otherwise practically devoid of lung markings. These fine lines do not correspond in location, direction or general appearance to the uniform tracings of the normal bronchial tree, or those occasionally appearing as a result of thickened pleura at the interlobar fissures. In certain cases continued observation, bronchoscopic studies and injections of iodized oil may be required to make the diagnosis.

DR. JAMES L. DUBROW, Des Moines, Iowa: In the last twenty months I have seen three cases of cystic disease of the lung. Reviewing the literature, I noted that most of the cases of congenital cyst of the lung may be grouped as follows: 1. Symptomatic. (*a*) Those presenting symptoms and signs simulating valvular pneumothorax wherein the mechanism is that of obstructive emphysema. This type usually occurs in children. However, Wilson reported a case of obstructive emphysema in an adult in whom periodic attacks of dyspnea necessitated the aspiration of air from the thoracic cavity with apparent symptomatic improvement. That he was dealing with a congenital cyst was evidenced by the fact that after the induction of artificial pneumothorax the visceral pleura was outlined. In a similar case there was absence of lung tissue on the right side simulating spontaneous pneumothorax. After the induction of artificial pneumothorax, the visceral pleura and the intrapulmonary hollow spaces were outlined. (*b*) Cystic degeneration of a whole lung simulating atelectasis. (*c*) Congenital bronchiectasis simulating the acquired form. In a case in which there was a demidense shadow covering the left lung, with elevation of the left dome of the diaphragm and retraction of the heart to the left, injection of iodized oil revealed grapelike sacculations in the left lung and no outline of the small bronchi of the lower lobe and those of the peripheral zone. The appearance of this lung after bronchography suggested bronchial maldevelopment rather than bronchiectasis. 2. Asymptomatic. (*a*) Solitary or multiple cysts with an open bronchial connection. The following points are of value in diagnosing congenital cyst of the lung: 1. The compressed lung cannot be seen fluoroscopically or roentgenographically. 2. Thoracentesis with injection of iodized oil through the center of the apparently structureless space on subsequent radiographic examination shows the bulk of the iodized oil retained at the point of injection. 3. Bronchography demonstrates bronchial maldevelopment with no outlining of the bronchioli. 4. Diagnostic pneumothorax outlines the visceral pleura.

DR. J. J. SINGER, St. Louis: I have seen several cases of lung abscess with the bronchoscope and have even operated but found that the cyst walls did not collapse or the walls of the cavity did not collapse. It was after reviewing these histories that I suddenly discovered I had more cases of congenital cysts than I thought. The important part in the discussion is what to do for the cyst. The cyst wall, because it does not collapse, is pushed over *en masse* as a large sac when it ruptures into the pleura, in that way displacing the mediastinal contents and producing the severe dyspnea. I want to show what may be done in the treatment of a polycystic lung. I refer to the induction of a pneumothorax. This was discovered by the following accident: A child had had a pneumothorax and fluid developed in the pleural space and the cyst wall. When the fluid was absorbed, symphysis of the two pleural leaves occurred, binding the cyst wall to the chest wall, so that no leakage of air into the pleura could take place, and the child became clinically well. I have attempted to treat a few cases that way. I had one case in which the opening into the cyst was not made evident by bronchoscopic examination or by injection. There may exist a connection of cysts through the trachea into the opposite lung. Unfortunately, in some of these cases there is no opening large enough between the trachea and the cyst wall, as Dr. Wood pointed out. In one case he cauterized the connection. I think that is an excellent idea and have attempted that in one case.

DR. HARRY G. WOOD, Rochester, Minn.: I wish to thank all of the men for their discussion and to add that Dr. Dubrow may have misunderstood me. In my experience, when there was displacement of the heart and mediastinum it was always away from the side in which the greatest pathologic change existed and not toward it, although some cases have been reported in which the reverse was true. I believe this is caused by an associated atelectasis, and not by the cystic disease.

Graham Lusk at Twenty-Five.—When I was twenty-five years old I found myself the head of a department of physiology at a salary of $300 per annum with an allowance of $150 annually for apparatus. The department consisted of one room in the old building at 150 York Street. Here Dr. L. C. Sanford and I brought up some pigs on the bottle and here the phlorhizin work on rabbits was started. I did all the cleaning and I mopped up the floor myself. . . . Later a new laboratory building was built in the yard, of which I had an entire floor . . . and at last I had some one to wash dishes. Here phlorhizin brought new information from dogs. . . . I never had an assistant while I was in New Haven. My salary and that of the other professors had been raised to $500 before I left. . . . In New Haven my life was one of peace for seven years.—Lusk, Graham, quoted by Light, A. E.: Graham Lusk, *Yale J. Biol. & Med.* **6**:487 (May) 1934.

THE PATHOLOGIC CHANGES OF THE ST. LOUIS TYPE OF ACUTE ENCEPHALITIS

HOWARD ANDERSON McCORDOCK, M.D.
WILLIAM COLLIER, M.D.
AND
SAMUEL H. GRAY, M.D.
ST. LOUIS

[EDITORIAL NOTE.—This paper, together with the papers of Dr. Eschenbrenner, Drs. Bredeck and Zentay and Dr. Jones, which follow it, concludes the symposium on epidemic encephalitis. In the last issue were published the papers of Dr. Neal, Drs. Leake, Musson and Chope, Drs. Muckenfuss, Armstrong and Webster, and Dr. Hempelmann.]

A large number of autopsies was secured during the recent St. Louis epidemic of acute encephalitis, the result mainly of the cooperation of the various public health offices, the general medical profession and the public. Sufficient material was obtained for a complete study of sixty-three cases. The thoracic and abdominal organs and portions of the spinal cord were examined in addition to the brain in about 90 per cent of the autopsies. An adequate neuropathologic study of all this material has not yet been accomplished, but a few representative cases have been studied in detail and a sufficient number of sections from the others have been examined to obtain a fair understanding of the pathologic alterations in this type of encephalitis. The essential pathologic process is an acute nonsuppurative inflammation of the central nervous system characterized by severe vascular congestion with occasional petechial hemorrhages, cellular infiltration of the nervous tissue and meninges with mononuclear cells, and degenerative changes in the nerve cells.

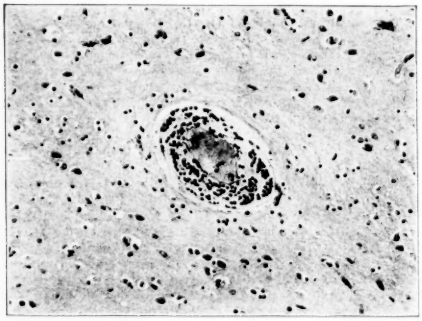


Fig. 1.—Perivascular cuff of lymphocytes about a small vein in the pons.

GROSS PATHOLOGIC CHANGES IN FATAL CASES

The only constant macroscopic alteration in the central nervous system was vascular congestion of varying degree. Every brain showed obvious congestion of the meningeal as well as of the intracerebral blood vessels. Petechial hemorrhages were found in the pia-arachnoid in the more severe examples of the disease. Cross-sections through the fresh brain revealed a light salmon-pink coloring of the gray substance in every instance in which the superficial vascular congestion was marked. In severe cases the entire cortex, as well as the gray substance of the midbrain, pons and spinal cord, instead of presenting the normal gray, was bright pink. In the usual case, however, this pinkish discoloration was blotchy in distribution, appearing as scattered patches in the cerebral cortex, basal nuclei, brain stem, pons or spinal cord.

The cerebrospinal fluid was noticeably increased in amount at twenty autopsies, and the clinical records of these cases showed that repeated spinal punctures had not been performed during life. The fluid was always clear and an exudate was never apparent in the meninges.

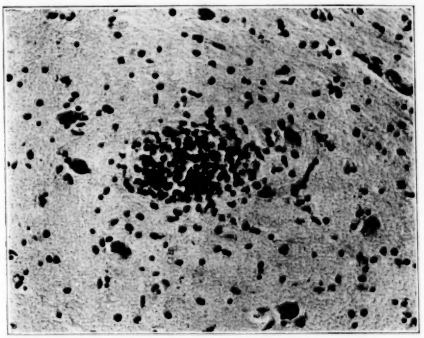


Fig. 2.—Focal collection of cells (glial nodule) in cerebrum.

The brain tissue presented an increased softness due to edema in many of the more acute cases. Thrombosis of venous sinuses or other blood vessels was never observed.

MICROSCOPIC CHANGES

1. *Congestion and Hemorrhage.*—Congestion of the meningeal or of the intracerebral blood vessels could be found in some of the sections from every case. The pink coloring of the gray substance that was apparent to the naked eye revealed, under the microscope, the most intense congestion of the vessels down to the finest capillaries. In twenty instances the vascular congestion was intense and in each of these small subarachnoid hemorrhages were found as well as an occasional extravasation of blood into a perivascular space in the substance of the brain or a petechial hemorrhage in the brain tissue.

2. *Cellular Infiltration.*—Two types of cellular infiltration were found. One was the typical perivascular accumulations of lymphocytes, the other diffuse or focal collections of various types of inflammatory cells. In all but two of the sixty-three brains examined collections of mononuclear cells were found surrounding the smaller vessels, forming the perivascular cuffs (fig. 1) that so commonly are observed in various diseases of the nervous system. The cells were usually confined to the Virchow-Robin space and consisted principally of lymphocytes with an occasional plasma cell and large mononuclear phagocyte.

In addition to the almost constant perivascular cuffing, the more severe cases also showed cellular

Read before the Section on Preventive and Industrial Medicine and Public Health at the Eighty-Fifth Annual Session of the American Medical Association, Cleveland, June 15, 1934.

infiltration which did not bear any apparent relation to blood vessels. Small focal collections of inflammatory cells (fig. 2) were present in the cerebral cortex, midbrain, pons and medulla. Most of the cells comprising these foci were apparently derived from the microglia, but also a few plasma cells and polymorphonuclears could occasionally be identified. The remains of a degenerated nerve cell could often be found at the center of one of these cellular foci, and this process of neuronophagia (fig. 3) was marked in all cases in which the cellular infiltration was extensive. In brains showing the most intense reactions, large areas of diffuse cellular infiltration (fig. 4) were often found in the basal nuclei or in the pons and medulla.

3. *Nerve Cell Degeneration.*—In almost every case, some degree of pathologic change was found in the nerve cells. Slight changes such as eccentricity of the nucleus, swelling of the nucleolus and perinuclear chromatolysis were common. All cases exhibiting extensive cellular infiltration were prone to show more marked degenerative alterations in the nerve cells (fig. 5), and of these the most frequent were shrinkage of the cell body with darkly staining, homogeneous cytoplasm, pyknosis of the nucleus or almost complete disappearance of the cell, producing a faint shadow-like remnant.

Typical inclusion bodies such as are associated with many virus diseases were not found in the nerve cells, although swollen nucleoli in degenerating cells frequently stained red with eosin or fuchsin. These acidophilic nucleoli resembled inclusions and might erroneously have been regarded as such were it not

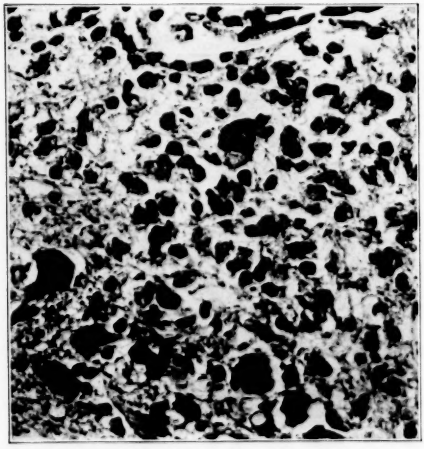


Fig. 3.—Proliferation of microglial cells about degenerating nerve cells (neuronophagia).

for the fact that serial sections did not reveal a normal nucleolus in these cells and that similar red staining nucleoli have been found in a variety of diseases affecting the brain.

4. *Cellular Infiltration of Meninges.*—Increased numbers of cells were found in the meninges in about three fourths of all the brains examined (fig. 6). The cells were for the most part lymphocytes, with a few plasma cells and large mononuclears. A purulent meningeal exudate was never encountered.

DISTRIBUTION OF LESIONS IN NERVOUS SYSTEM

The vascular congestion was fairly uniformly distributed throughout the nervous system. The pink discoloration of the gray substance due to capillary congestion was not confined to any particular area but

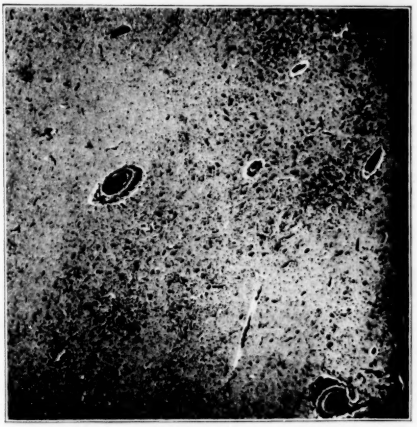


Fig. 4.—An area of diffuse cellular infiltration extends diagonally across the picture. Two large vessels have perivascular cuffs.

was most frequent in the pons and medulla. Both horns of the spinal cord were bright pink at all levels in two severe cases in which the entire cord was removed.

The greatest concentration of lymphocytes in the meninges was usually found at the base of the brain.

Both the intensity and the distribution of the cellular infiltrations presented great variations in the different cases. The most severe reactions were found in the brains of those who died early in the epidemic. In these, inflammatory foci were present in all regions of the brain and often in the upper cord. Large areas of diffuse infiltration with marked nerve cell degeneration also occurred in these early severe cases.

When numerous the perivascular cuffs were found in all parts of the brain, but when few in number they usually were present in the pons.

No particular area consistently showed degeneration of the nerve cells, nor did the severity of the cellular infiltration or the vascular congestion seem to bear any definite relation to this change. Damaged nerve cells were often found in the cortex but were more frequent in the pons, basal nuclei and medulla. The cells of the nuclei of the cranial nerves were seldom affected except in a few instances when very severe reactions were widespread throughout the brain.

Cellular foci and degenerative changes in the nerve cells were found in the cervical and lumbar regions of the spinal cord in a few cases. The two horns were equally involved and the selective destruction of the anterior horn cells so characteristic of anterior poliomyelitis was not apparent.

CHANGES IN OTHER ORGANS

Chronic changes in the heart, vascular system and kidneys were common, because most of the autopsies were performed on the bodies of older persons. Bronchopneumonia was the most frequent terminal process.

About one third of the cases showed an acute change in the kidneys which was apparently related to the disease itself and not to some antecedent condition. This consisted of swelling and congestion with a hemorrhagic pyelitis. Microscopically there was cloudy swelling and necrosis of the tubular epithelium, with distention of the glomerular vessels and occasionally a small amount of blood in the glomerular space or in the tubules.

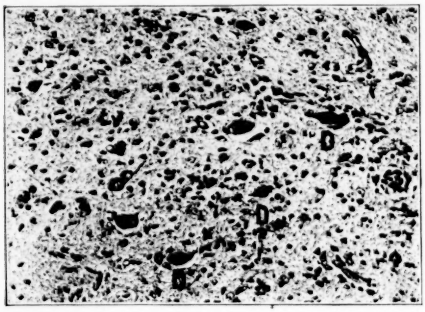


Fig. 5.—Degenerative changes in nerve cells of the pons. The three black irregular objects above the letter *D* represent shrunken, degenerated nerve cells which stain a homogenous dark red with eosin. The nuclei no longer take a stain with basic dyes.

Intranuclear inclusions have been observed in about one fourth of twenty-five kidneys that so far have been thoroughly examined. These were found in the epithelial cells of the convoluted tubules and of Henle's loop. Their significance in this type of encephalitis has yet to be determined; they are not, however, present in routine material from other diseases.

BACTERIA IN THE NERVOUS TISSUE

Small abscesses were present in the brain tissue in three cases and were amply explained by the presence of primary suppurative processes in other organs. Bacteria were demonstrated by Gram stains in the brain tissue in each of these three cases. These were the only instances in which bacteria were found in the nervous tissue with any signs of a cellular response to their presence, although bacteria that were the result of postmortem invasion were observed in several cases in which autopsy was deferred for a long time or in tissue that had been transported from a distant hospital before fixation.

Bacteria or other micro-organisms were not consistently found and this was in keeping with the negative character of cultures of the spinal fluid and of the brain emulsion used for experimental purposes.

COMPARISON WITH OTHER TYPES OF ENCEPHALITIS

The early severe cases that first came to autopsy showed most intense inflammatory reactions in many different parts of the brain. A comparison of these with material from fatal cases of the lethargic type [1] of von Economo and with published descriptions of this condition revealed several striking differences. The lesions of the two types were qualitatively similar but showed marked differences in degree and distribution. The severe cases of the St. Louis type differed from the lethargic type in the following respects:

1. The meninges showed more intense infiltration with mononuclear cells than usually was found in the lethargic type.

2. Degenerative changes in the nerve cells were more frequent and neuronophagia was more marked.

3. The inflammatory foci were more widespread throughout the brain, often occurring in great numbers in the cerebral cortex, and were not restricted to the midbrain or basal nuclei.

4. The cranial nerve nuclei, especially the third, rarely showed degenerative changes such as are frequent in the von Economo type.

5. There was more extensive involvement of the spinal cord in the St. Louis type.

As the epidemic progressed, the lesions became less intense and not so widely scattered. Many of the milder cases showed about the same degree and intensity and a similar distribution in the midbrain, basal nuclei and pons as was seen in the lethargic type. Therefore, as far as these milder cases are concerned it is impossible to differentiate them with any degree of certainty from the lethargic type on the basis of the pathologic lesions alone.

The lesions described by the Japanese in their type B encephalitis are similar in many respects to those of the St. Louis type. The intensity of the meningeal infiltration, the frequency and distribution of the focal collections of cells, the absence of cranial nerve nuclei involvement, and the frequent presence of lesions in the spinal cord, are strikingly similar in both of these types. The areas of softening (associated with the disease) and the retrogressive changes in the cellular foci (glial nodules) which they described were infrequent in our material.

Fig. 6.—Infiltration of meninges with lymphocytes and large mononuclear cells. A small strip of cortex extends across the bottom of the picture.

1. Greenfield, J. G.: Brit. M. J. **2**: 782 (Nov. 20) 1920; **2**: 535 (Sept. 24) 1927. Boyd, W.: Quart. J. Med. **18**: 153 (Jan.) 1925.

SUMMARY

The essential pathologic process in the St. Louis type of encephalitis is a nonsuppurative inflammation of the nervous system characterized by intense vascular congestion, cellular infiltration, and degenerative changes in the nerve cells.

Severe examples of the disease which closely resemble the Japanese type B [2] can readily be distinguished from the lethargic type, although the milder cases cannot be differentiated from the latter on the basis of the pathologic lesions alone.

Washington University School of Medicine.

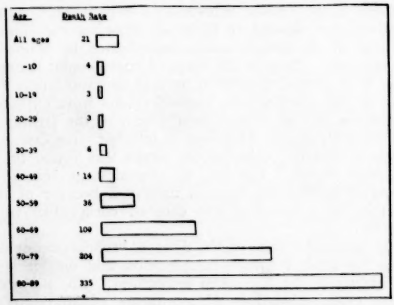
THE ENCEPHALITIS EPIDEMIC IN ST. LOUIS CITY AND COUNTY, 1933

PROGNOSIS

ANDREW B. JONES, M.D.
ST. LOUIS

Increasing age influenced prognosis more than any other single factor, the greatest percentage of mortality occurring in the aged, as shown in the chart. The presence of preexisting organic diseases such as nephritis, heart disease or debilitated states greatly increased the chances of a fatal termination.

No single clinical sign or symptom considered alone was of much prognostic significance. Absent reflexes and retention of urine indicated a fatal outcome regardless of the duration of the illness, age of the patient, or number of cells in the spinal fluid. The development



Mortality rate per hundred thousand of estimated population.

of râles in the chest, bronchopneumonia and the presence of albumin, casts and blood in the urine were of grave prognostic significance.

The duration and severity of the illness were extremely variable. The mild or abortive case lasted for two or three days, the ordinary case from seven to fourteen days, the chronic case from a few weeks to months. In a very small percentage of the aged there existed for days, weeks or months a state of more or less clouding of consciousness characterized by apathy or unconcern during the daytime, spontaneous whining or crying at nights, and in some cases the night prowling of the arteriosclerotic and those with senile dementia. Not infrequently, neurasthenic-like states followed immediately on the subsidence of the acute disease, persisting for weeks and months. Almost without exception, these neuraesthenic-like states occurred in persons with a neurotic diathesis.

Extrapyramidal tract signs developed during the febrile stage in a very few cases, together with varying degrees of clouding of consciousness with spontaneous laughing and crying, unintelligible speech and periods of anxiety and apprehension, dragging on for many months, the majority making a complete recovery and the remainder still showing signs of improvement. The temperature of this group may have returned to normal and remained practically normal after about the second week. When death occurred it was the death of an overwhelming toxemia. More than 50 per cent of the 221 deaths occurred between the first and seventh days of the illness (table 1).

TABLE 1.—*Interval Between Onset and Death*

Interval	Deaths
1 day	2
2 days	10
3 days	11
4 days	23
5 days	24
6 days	25
7 days	16
1 week or less	111
1 to 2 weeks	62
2 to 3 weeks	10
3 to 4 weeks	8
4 to 5 weeks	5
5 to 12 weeks	5
Onset unknown	11
Total	221

An elaborate follow up of the patients who recovered was undertaken by the Public Health Department of the City of St. Louis. This survey was begun early in December 1933 and completed the first of March 1934, comprising a total of 375 cases in the city of St. Louis. A copy of the tabulated symptoms present after the illness is presented in table 2.

TABLE 2.—*Follow-Up Tabulation of Patients Who Recovered*

Symptoms Noted in Follow-Up Reports	No. of Cases
Headaches	100
Pains in various parts of the body	90
Restless in sleep or sleepless	86
Tremor of hands or other part of body	72
Nervous	69
Impaired vision, or pain or burning of eyes	66
Dizziness	56
Forgetful or confused	54
Reflexes hyperactive or sluggish	48
Personality changes—more excitable or irritable, or more sullen or melancholy	45
Loss of strength, weakness	29
Easily fatigued	24
Speech affected—slower, stammering or jerky	23
Drowsy, lethargic	22
Paralysis of face or other part of body	21
Increased perspiration	19
Diminution of hearing	14
Impairment of ability to concentrate	13
Withdrawal from social contact	4
Ptosis of eyelid	3
Rapid decay of teeth	1
Difference in size of two legs	1
Knee bending habit	1
Weakness in legs	1
Fits	1
Postencephalitic involvement of cerebrum; out of head most of time	1

In my own private cases and the cases of a number of my colleagues, in the aggregate a sizable number, recovery was complete, without residuals of any sort. Therefore, I think it is safe to say that this table is inaccurate and misleading.

3720 Washington Boulevard.

2. Kaneko, R., and Aoki, Y.: Ergebn. d. inn. Med. **34**: 342, 1928.

Read before the Section on Preventive and Industrial Medicine and Public Health at the Eighty-Fifth Annual Session of the American Medical Association, Cleveland, June 15, 1934.

THE TREATMENT OF ENCEPHALITIS IN THE ST. LOUIS EPIDEMIC OF 1933

JOHN W. ESCHENBRENNER, M.D.
ST. LOUIS

Herein is presented the treatment and care developed during the observation of 348 cases of epidemic encephalitis at the St. Louis City Isolation Hospital last summer. This group of cases of epidemic encephalitis descended on us with surprising rapidity. We were at a loss to supply any specific treatment because our knowledge of the treatment of this type of epidemic encephalitis was limited. It was thus necessary to resort to symptomatic treatment based on clinical experience with similar conditions. The toxic encephalitis that follows the contagious diseases and acute infections was the most similar condition. In presenting the treatment of encephalitis, I wish to call to mind that many of these patients, adults and children, had very mild symptoms, the course of the disease was very short, there were almost no complications in these mild cases, and therefore very little therapy was required. The most of the following deals with the more severe types of cases and those that were complicated.

As is true in other contagious diseases and in neurologic conditions in which the patients are in stupor or coma and are sometimes incontinent, good specialized nursing care is important. Graduate nurses were therefore delegated to the care of these patients. All the patients were given bed rest, a soft diet and forced fluids.

With the knowledge that in the acute stage of the disease there is an acute diffuse inflammatory reaction in the brain tissue and that the symptoms were probably due essentially to cerebral edema and increased intracranial pressure, the treatment instituted was designed to relieve this condition mechanically. This consisted in the use of spinal punctures and hypertonic dextrose solution intravenously. For the relief of symptoms and as a part of our diagnostic methods, a spinal puncture was done on admission on all patients. Those who had increased pressure in the fluid usually were given some relief of their discomfort. After the first lumbar puncture, the spinal fluid pressure was usually not sufficiently increased to warrant additional spinal punctures as a routine. However, when indicated by more marked signs of meningeal irritation or further symptoms of increased intracranial pressure, such as headache, stupor, vomiting or convulsions, a second spinal puncture was done. The spinal fluid was usually withdrawn until the pressure became normal, amounting to from 10 to 60 cc.

Hypertonic dextrose solution intravenously was given as a routine to nearly all patients. This was given as a 10 per cent solution, 750 cc. to the adults and correspondingly smaller doses to the children. This was given daily until after the severe part of the disease was past.

Those with severe signs of cerebral edema were given 50 cc. of 50 per cent dextrose solution intravenously every twelve to twenty-four hours. This was found to be most efficacious in some cases. Fluids were forced on all the acutely ill. In the more stuporous patients it was necessary to resort to the use of a nasal tube for feedings. In the dehydrated patients, saline solution was administered subcutaneously. Though most of the patients were stuporous, some were exceedingly restless and required large doses of sedatives.

The hyperpyrexia that was present in many of the acute cases was treated with hydrotherapy, several ice bags being applied continuously to the head and body and tepid sponge baths and alcohol rubs being given every four hours. The ice bags to the head relieved the headaches considerably.

We found that the constipation, sometimes rather obstinate, was relieved better with the saline laxatives, combined with enemas. We used drastic saline purges when the stupor was more marked in an effort to further reduce the cerebral edema. Diarrhea, a less frequent complication, was controlled by the use of camphorated tincture of opium and bismuth subnitrate in fairly large doses.

We were particularly watchful for retention of urine in the women and in the older men. When present, usually it did not recur after one or two catheterizations but sometimes was of long enough duration to necessitate the use of a retention catheter for several days. In those cases we were more likely to find pyelitis or cystitis and we accordingly treated them with alkalis, alternating every several days with acids combined with methenamine.

Various other intravenous and serum medications were tried in the acute stage but were found to have little effect on the clinical course of the disease. The drugs used intravenously were arsphenamine, quinine and mercurochrome, but no beneficial effects were observed. Rosenow's encephalitis serum was used in several cases. Blood transfusions were given to other patients but seemed to have no effect on the clinical course of the disease unless complicated by bronchopneumonia. Because the blood of convalescent patients has been proved to contain neutralizing substances for the specific virus of the disease, results were expected from the use of convalescent serum in the treatment of the acute stage. However, as in other virus diseases, such as measles, convalescent serum was found to be of little value. The use of convalescent serum in exposed individuals was not indicated, because of the paucity of more than one case of encephalitis in a family.

In the acute stage of the disease, bronchopneumonia was the most frequent complication and was treated according to the individual indications. The majority were given inhalations of a mixture of 30 per cent carbon dioxide in oxygen for ten minutes every two hours. Fifty per cent dextrose solution was given intravenously every six to twelve hours in an attempt to reduce the congestion of the lungs. As in pneumonias complicating other diseases, the patient's position was changed frequently. The toxic patients were given repeated small blood transfusions. We felt that this was helpful in some cases. The older age group of patients with bronchopneumonia, showing signs of myocardial decompensation, were digitalized and then a maintenance dose was continued.

Delirium tremens, another complication occurring during the acute stage of the disease and usually in the young men, responded readily to large regular doses of paraldehyde.

Uremia was next to bronchopneumonia in incidence and seriousness but occurred late in the disease, usually

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when a patient was apparently improving and over the acute signs of encephalitis. These patients were treated by forcing fluids by mouth and parenterally to the extent of 5,000 cc. in twenty-four hours. Again we favored the use of dextrose intravenously.

After the acute stage was over, some of the more severe cases were followed by a mild Parkinson's syndrome. For this we gave phenobarbital, sometimes continued in fairly large doses. The greater percentage of these patients recovered from the syndrome. The other complications, much less frequent in incidence, were taken care of symptomatically.

Encephalitis is essentially a self-limited disease. Considering the fact that the Isolation Hospital received more moribund cases and that our mortality rate was practically the same as that for the city at large, I think that we can feel that the foregoing symptomatic treatment was of value.

It was fortunate, in view of the fact that specific treatment was not available, that in most cases the recovery from encephalitis was rapid and apparently without residual effects. In analyzing the results of the treatment and the mortality rate, it is more gratifying to find that the deaths were in individuals who have an exceptionally poor prognosis in the event of any illness because of various preexisting conditions.

Isolation Hospital, 5600 Arsenal Street.

HANDLING OF THE ST. LOUIS EPIDEMIC OF ENCEPHALITIS

JOSEPH F. BREDECK, M.D., D.P.H.
Health Commissioner
AND
PAUL J. ZENTAY, M.D.
ST. LOUIS

The handling of the St. Louis epidemic of encephalitis presented a novel situation, as we were dealing with an entirely new disease not observed previously in this country. Because of this fact we had to devise our own plans and could not rely on any precedent or previous experience. No originality or anything startling is claimed in this presentation. We maintain only that the situation was promptly recognized and accepted and rational public health measures were introduced immediately. An adequate organization was set up in the shortest possible time and the health division took and maintained the leadership in all phases of the emergency.

As soon as the first few cases were diagnosed at the St. Louis Isolation Hospital, it was evident that we were dealing with an unusual kind of encephalitis suddenly appearing in epidemic form. Although less than twenty cases were hospitalized at the time and all of them came from St. Louis County, we anticipated, as it seems, correctly, that an extensive epidemic was threatening the St. Louis metropolitan area. At that time, of course, we could not foresee that more than a thousand cases would be reported in less than two months.

On the very first day after the clinical and public health diagnosis was established, a statement was issued informing the public and the medical profession of the existing situation. Steps were immediately taken to establish a public health organization that would be able to cope with the problem. A few words concerning the political set up in St. Louis and St. Louis County are necessary in order to throw some light on the difficulties that had to be overcome at the beginning of the epidemic.

St. Louis City is an independent political unit and has absolutely no political ties with the surrounding territory of St. Louis County. It is also situated on the eastern boundary of the state of Missouri, and the metropolitan area includes two adjoining counties of the state of Illinois. It is evident that, in case of an epidemic involving this area, success can be secured only if some kind of inclusive organization can be built up and uniform regulations can be adopted. This was still more true in the case of an unusual public health problem never seen before.

Such a public health organization was conceived by us long before the beginning of the emergency, but under the pressure of the rapidly spreading epidemic it was put into effect within the shortest time possible. The St. Louis Metropolitan Health Council was called into existence in less than four days after the outbreak of the epidemic and it was completely organized and functioning in less than a week after the first case of encephalitis was reported. Its purpose was to bridge the existing political gaps and eliminate inevitable conflicts of authority and to work out a harmonious cooperation between the various public health units in the metropolitan area. It was a consultative body, including in its membership all the constituted health officers and other public health workers and also many physicians and others who were interested in the problem of encephalitis. It met according to needs and through its prestige and through the work of its committees made the position of the health officers infinitely easier. Two important committees were appointed at the very first meeting. These were the Committee on Rules and Regulations and the Committee on Scientific Research. The Committee on Rules and Regulations devised all the necessary public health regulations and submitted them to a meeting of the council. The result of its work was that the same form of procedures was followed by all health officers in the entire metropolitan area. The value of this is perfectly clear, particularly since under the unusual circumstances there might have been many contradictions, or at least disharmonies, between the regulations of the city health division and the other health units. The same committee also recommended the use of certain blank forms in field investigations and outlined a form for clinical observations for the various hospitals.

The Committee on Scientific Research had as its main purpose the centralization of all scientific work in the hands of laboratory workers particularly interested in this type of research. All available autopsy material was carefully preserved and handled under the supervision of this committee.

The two schools of medicine of Washington University and St. Louis University cooperated in a splendid manner. Washington University School of Medicine concentrated chiefly on the study of etiology (evidently a virus). Laboratory experiments on the various animals were done in the laboratories of Washington University School of Medicine. St. Louis University School of Medicine was mainly interested in the clinical study of the disease.

The early and complete centralization of the research work by the committee brought most satisfactory

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results, which progressed even beyond our boldest expectations.

Later on two more committees were added to the organization of the Metropolitan Health Council. They were the Committee on Follow Up and the Committee on Scientific Publications.

The Committee on Follow Up was and is at present interested in the after-effects of the disease. It devised a follow-up questionnaire and organized the work of reexamination of patients for the first time approximately four months after the onset of the disease. The follow-up work was to have been continued every four months and every six months for the next year. The value of such an intensive study is evident, because, without such careful follow up, knowledge of the sequelae of epidemic encephalitis will never be obtained.

The Committee on Scientific Publications brought together in a community enterprise all those who were interested in the study of the epidemic and at the present time a monograph is in the press and will be published by the U. S. Public Health Service about July 1. This monograph will give a comprehensive picture of the entire problem as seen in the St. Louis epidemic and we hope it will be an unusual contribution of St. Louis medicine to American medical literature.

The public health regulations adopted by the Metropolitan Health Council were as careful and at the same time as lenient as the situation warranted them. We tried to impose as little inconvenience on the families as possible. No quarantine was established, only isolation was insisted on. No placarding was done. General hospitals were opened for cases of encephalitis. The only demand was for careful technic of isolation. Whenever the number of patients justified it, separate floors were opened for encephalitis patients. The isolation period was arbitrarily set at three weeks, but patients were often released from the hospital before this period if home conditions were such that isolation was possible there. The public schools were opened at the regular time. No restrictions were put on public gatherings or theaters. The most difficult problem for the Metropolitan Health Council was to prevent a panic and forestall unnecessary procedures that were not warranted by actual scientific facts. All kinds of fantastic suggestions were made by medical men and the public, and it was not an easy job to stay on strictly scientific grounds.

Ideal and satisfactory cooperation existed from the beginning to the end of the epidemic between the Metropolitan Health Council and the U. S. Public Health Service. The presence of the scientists sent by the Surgeon General to St. Louis was an important factor in steadying the situation. The untiring efforts of the Public Health Service scientists brought many valuable contributions in the scientific research work.

All facilities of the Metropolitan Health Council and of all the hospitals were thrown open to all visitors, who came from far and near.

The publicity work was carefully controlled by the Metropolitan Health Council. All information to the press was given out through the office of the secretary of the council. The daily press of St. Louis and the national and international news agencies represented in the city were most cooperative and were always willing to submit copies for correction. If any incorrect or distorted information appeared, the source of the news was not at fault but rather the sensational headlines or other outside influences. Complete frankness characterized the policy of the health council. Daily bulletins were issued and mailed to every member of the council showing the number of new patients and the number of deaths reported to the various health departments. We feel that, owing to this complete frankness, a panic which otherwise might have prevailed was prevented.

The experiences of the St. Louis epidemic will be, we feel, an interesting and valuable contribution to public health work and also to clinical medicine and laboratory research. Looking back on the problem from a wider perspective, as it is possible almost eight months later, we may state that more was accomplished in many ways, particularly toward unraveling the problem of encephalitis, than it was even dared to hope for at the beginning of the epidemic. Also, it is fair to state that almost everything that was done during the epidemic might be repeated without a single change in a similar situation. The organization of metropolitan health councils, we feel, is invaluable to public health administration. Only in this way can uniform information be gathered and uniform regulations be initiated in the handling of public health problems extending beyond local jurisdiction.

634 North Grand Boulevard.

ABSTRACT OF DISCUSSION

ON PAPERS OF DR. NEAL, DRS. LEAKE, MUSSON AND CHOPE, DRS. MUCKENFUSS, ARMSTRONG AND WEBSTER, DR. HEMPELMANN, DRS. MC CORDOCK, COLLIER AND GRAY, DR. JONES, DR. ESCHENBRENNER AND DRS. BREDECK AND ZENTAY

DR. W. E. CONKLIN, Paris, Ill.: In August 1932 a disease of unusual and vicious character suddenly attacked some thirty people in Paris, Ill. After several conferences and consultations a diagnosis of epidemic encephalitis was made, based on the following symptoms and signs. The first symptom to appear was headache, which rapidly became more severe and was accompanied by nausea and vomiting, which was projectile in character. The temperature rose rapidly in the first twenty-four hours to 104 and 105 F. The pulse was out of all proportion to the temperature and remained between 80 and 100; the respiratory rate was also correspondingly slow, being about normal. All these occurred in the first twenty-four hours of the disease. The patients then passed into a semiconscious state, during which they were restless, picked at the bedclothes and at times required restraint. The more seriously ill patients became irrational and delirious. At no time in this semiconscious state could the patient answer questions. The less severely ill patients could reply with difficulty. These persons complained of severe headache and nausea and desired to lie in a darkened room. They also complained of double vision. This phase was followed by delirium, coma and death or recovery. The time elapsed from the onset of the disease to delirium was from twenty-four to forty-eight hours. During this stuporous state the patients also suffered from involuntaries. The face had a masklike expression and the eyes were fixed. On moving the head the patient complained of pain. The neck was rigid and painful to the touch. The tongue showed a fine tremor but no deviation. The throat was injected but there was no complaint of soreness, cough or coryza. There was a hypertonicity of all the muscles, and extreme irritability to any kind of stimulation. The urine and the blood count showed nothing abnormal. The spinal fluid was clear and under increased pressure. The prognosis varied with the stage of the disease and the age of the individual. Those who passed from delirium into coma did not recover. These persons were invariably over 60 years of age. Younger persons seemed to have a better reaction to the disease, and the tendency to recovery was marked. The condition was confined to the higher age groups. There were no two cases in the same household. It appeared in all walks of life, there being no evident environmental factor. Treatment was entirely symptomatic. Isolation

was the only possible prophylaxis. The course of the disease was stormy. The active symptoms terminated in death in a week or recovery began. Recovery was gradual and progressive, there being no instance of relapse or recurrence, and no sequelae. There was no evidence of contagion.

DR. FRANK R. FINNIGAN, St. Louis: Dr. E. C. Rosenow studied the encephalitis epidemic at the DePaul Hospital in St. Louis in the early fall of 1933. He had prepared an antistreptococcus serum from previous sporadic cases of encephalitis throughout the country, and this serum was administered to some of the patients at the hospital. There were thirty-five severe cases of epidemic encephalitis admitted to the DePaul Hospital during the epidemic of 1933. Treatment other than the serum was chiefly symptomatic. The cases in which the serum was administered were not selected. The total number of cases was thirty-five. Fifteen patients received serum and twenty did not. Of the fifteen patients who received the serum, two died and thirteen recovered, making a mortality rate of 13.3 per cent. Of the patients who did not receive the serum, seven died and thirteen recovered, making a mortality rate of 35 per cent. The average age of those who died in the group treated with serum was 65. The average age of those who died in the group not treated with serum was 64. The ages of those who recovered in both groups was approximately the same. They all exhibited a slight to moderate leukocytosis with a slight shift to the left. They all had an increased spinal fluid cell count, globulin and sugar. The differential count of the fluid showed a preponderance of lymphocytes in the majority of cases. I do not feel that the spinal fluid cell count was of any prognostic aid. In a group of twelve cases of postencephalitic headache and neuritis in which no serum was given, striking results were obtained by the use of the antistreptococcus vaccine and serum. These figures support the clinical impression that the specific treatment is of value.

DR. J. W. ESCHENBRENNER, St. Louis: Three cases were treated with Rosenow's serum. Two patients received 5 cc. twice and one received 5 cc. once. The last mentioned patient, receiving only 5 cc., was transferred to another hospital and died later. I think that one of the patients receiving 5 cc. twice also died.

DR. RALPH S. MUCKENFUSS, St. Louis: I wish to add a few statements regarding the antistreptococcus serum of Dr. Rosenow. I object to calling the antistreptococcus serum specific. A number of strains of streptococci isolated by Dr. Rosenow from encephalitis patients and considered by him capable of reproducing the typical disease in rabbits were studied in Dr. Bronfenbrenner's laboratory. The only lesion caused in experimental animals by these strains was meningitis. This was obvious on microscopic examination but not grossly. In addition, serum of convalescents known to have neutralizing antibodies for the virus had no influence whatever on the activity of these streptococci.

DR. PAUL J. ZENTAY, St. Louis: As secretary of the Metropolitan Health Council and ex-officio secretary of the follow-up committee, I can qualify some of these statements. We handled the follow up of almost 840 cases. Anybody who tries to follow up a large number of cases of any type knows what difficulties one encounters in evaluating the reports. The follow up was organized in such a manner that all the cases treated in the hospitals were reexamined at the same place and by the same physicians who observed the cases during the illness. In many instances in which private physicians took care of the patients during the acute illness, we had to refrain from examination of the patient and resort to the questionnaire method. Sending questionnaires to doctors and getting replies naturally involves many errors, and as we try to interpret these questionnaires we have found that many of the doctors misunderstood our questions and replied in the sense of what they found during the acute illness and not at the time of reexamination. It is planned to have another reexamination in the next few months and still another before the end of the year, and two more the following year. In this way we may be able to say something more reliable about prognosis. So far as the publications are concerned, in the monograph which is in the press now a part of the chapter on etiology is devoted to the experiments with streptococci. Any one interested in the results of those experiments can read there just what they are worth. The statement that no publicity was given to the streptococcus theory is incorrect. The St. Louis newspapers were practically flooded with publicity on that phase of the problem.

Clinical Notes, Suggestions and New Instruments

CHOLECYSTITIS AND CHOLELITHIASIS OF CHILDHOOD

HOWARD B. HAMILTON, M.D.; C. O. RICH, M.D., AND J. DEWEY BISGARD, M.D., OMAHA

A case report of cholecystitis with cholelithiasis in a boy, aged 8 years, is here recorded to stress the necessity of consideration of lesions of the gallbladder in the differential diagnosis of abdominal disease in children. It is probable that pathologic changes in the preadolescent gallbladder are not as rare as clinical and postmortem records indicate. For this reason and for the reason that many of these cases present long and indefinite antecedent histories, we believe that children who have indefinite abdominal symptoms of epigastric pain and indigestion should be investigated more frequently with such diagnostic aids as cholecystography.

In 1928 Potter [1] reported four personal cases of gallbladder disease in children 4½, 6, 11 and 15 years of age, and he supplemented the report with a review of the literature. He was able to collect 226 cases in which the ages were less than 15 years, as follows: fetuses 2, new-born infants 12, 1 day old 9, infants 19, less than 1 year 18, between 1 and 5 years 26, between 5 and 10 years 55, and between 10 and 15 years 85. Other interesting facts were gleaned from this analysis. In relation to sex the division was males 62, females 74, not stated 90. Cholecystitis was associated with stones in 44, without stones in 59, with jaundice in 30, and not stated in 93 cases. Stones were present in 140, absent in 48, and not stated in 128 cases. Primary malignant neoplasms occurred in 2 cases. Jaundice was present in 64, absent in 34, and not stated in 128 cases.

REPORT OF CASE

A. A., a boy, aged 8 years, was admitted to the University Hospital, April 5, 1934, and related that he had been perfectly well until six days previously, when he was seized suddenly with moderately severe cramplike pain in the epigastrium. The pain was partially relieved two hours later when he vomited several times. The vomitus contained bile and some undigested food.

Twelve hours after onset, the pain shifted to an area immediately to the right of the umbilicus. No relief was obtained from ingestion of soda or from three enemas.

Twenty-four hours after the onset the pain subsided; but soreness just to the right of the umbilicus and nausea persisted until admission. Despite constant nausea, dizziness, occasional twitches of pain and weakness, he attended school for three days.

Four hours before admission he was again suddenly seized with severe pain just to the right of the umbilicus, and he vomited several times. The vomitus contained some food but no blood or coffee grounds. The pain persisted without relief.

From his second year of life to the present he had complained periodically of attacks of pain in the epigastrium and right hypochondrium associated with nausea and gaseous eructations but never with vomiting. He had never complained of pain in the back, nor had there been jaundice, clay-colored stools, or evidence of bile in the urine. With recent attacks there had frequently been an elevation of temperature to 102 F. but no chills.

The family and past histories were essentially negative and there was no history of familial jaundice or gallbladder disease.

The boy was well developed and well nourished but not obese. His cheeks were slightly flushed and he was more comfortable

From the Department of Pediatrics and Surgery, University of Nebraska College of Medicine.

1. Potter, A. H.: Gallbladder Disease in Young Subjects, Surg., Gynec. & Obst. **46**: 795 (June) 1928.

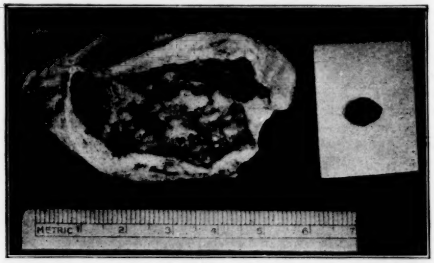
with the right thigh flexed. Both sclerae were slightly injected but were not icteric. The tonsils were large and infected. The lungs were clear and the heart was normal in size and had normal rhythm and no murmurs.

The abdomen was distended moderately and diffusely and there was considerable spasm of all the muscles of the right half of the abdomen, with boardlike rigidity of the right side above the umbilicus. Immediately to the right of the umbilicus, palpation elicited very acute tenderness, and from this point to the costal margin, moderately acute tenderness. There was moderate tenderness in the right lower quadrant. Pressure in both lower quadrants and hyperextension of the thigh caused pain in the region of the umbilicus. There was no tenderness in the flanks, no palpable masses, and no shifting dulness or fluid wave. There was hyperesthesia of the skin of the entire right upper quadrant. Rectal examination elicited no additional information. The extremities and reflexes were normal.

On admission the blood pressure was 95 systolic, 66 diastolic, the temperature 102 by rectum, the pulse 120 and the respiration 24.

The urine was entirely normal and contained no bile. The blood was as follows: hemoglobin 90 per cent, red blood cells 4,690,000, white blood cells 19,400, with segmented polymorphonuclears 55 per cent, staff cells 15, young cells 2, lymphocytes 23 and mononuclears 5.

With an indefinite diagnosis in which was considered acute inflammation of a high appendix, acute cholecystitis and perforated peptic ulcer, operation was performed by one of us



Gallbladder and the solitary stone that it contained, in a boy aged 8 years. Note the thick densely fibrotic wall.

(J. D. B.) immediately after admission. Under ether anesthesia the abdomen was opened through a high right rectus incision and was found to contain a moderate amount of clear, free fluid. An enlarged liver showing evidence of hepatitis presented into the wound, with its lower margin on a level with the umbilicus. A markedly thick-walled, injected and slightly edematous gallbladder was freed from the omentum and duodenum, by which it was almost completely concealed and to which it was adherent by both recent delicate and old very dense adhesions. So firm were the adhesions between the gallbladder and the duodenum that cleavage could be accomplished with safety only by peeling the gallbladder serosa off and leaving it attached to the duodenum. There were several enlarged lymph nodes in the hepaticogastroduodenal peritoneal fold. The common and hepatic ducts were not dilated but their walls were thickened. Palpation elicited no evidence of stones in the ducts. The gallbladder was aspirated of 10 cc. of thick black bile containing no pus and was then removed from the bottom upward.

The appendix appeared to be normal in appearance except for mild injection. On account of the acute inflammation of the biliary tract, it was decided to defer its removal until later.

A cigaret wick was placed in the right kidney fossa and the wound was closed in layers about it.

The gallbladder wall measured between 4 and 5 mm. in thickness and was densely fibrotic and somewhat edematous. The vessels on the surface were widely dilated. The mucosa was markedly injected and presented small focal areas of necrosis. It contained one stone composed of bile salts. The gallbladder and stone are depicted in the accompanying illustration.

The patient's convalescence was uneventful. Twelve days after the cholecystectomy the appendix was removed through a McBurney incision and he was discharged from the hospital five days later. Two months after discharge, he reported that he was feeling perfectly well.

1436 Medical Arts Building.

COARCTATION OF THE AORTA

WILMOT F. PIERCE, M.D., CHICAGO

Death from coarctation of the aorta occurs sometimes from rupture of a mycotic aneurysm in the aortic wall. Hamilton and Abbott [1] mention four such deaths in 200 persons with coarctated aorta, and Evans [2] mentions two in twenty-eight. In the case reported here the aorta also broke, but it was involved from without by suppurative mediastinitis. Part of the abscess wall was formed by the aorta and esophagus.

REPORT OF CASE

Clinical History.—B. P., an Italian laborer, aged 35, a patient of Dr. F. H. Straus, was admitted to the Presbyterian Hospital on three occasions. The first was Sept. 26, 1927, when he came in with bronchopneumonia. He had worked in coal mines at hard manual labor for many years and there had never been any symptoms referable to the cardiovascular system. Physical examination revealed, besides the bronchopneumonia, an enlarged heart, palpable and visible pulsations in both suprascapular regions and, over the carotid and subclavian arteries, rough systolic murmurs in both suprascapular regions and lateral to the vertebral column on both sides at the level of the seventh cervical vertebra. The blood pressure was 136 systolic, 86 diastolic; the blood Wassermann reaction was negative. The pneumonia and enlarged heart were confirmed roentgenoscopically. Subsequent blood pressure readings with the patient recumbent were: right arm, 144/70; left arm, 148/66. Nothing significant was discovered by other laboratory examinations. It was thought at this time that the blood pressure was temporarily lowered in the midst of an influenza-like infection and that the pulsations in the upper part of the body were due to a large heart and lowered peripheral tonus. The patient was discharged as cured, October 9, thirteen days after his admission.

He returned to work in the coal mines, but two months after his discharge from the hospital he began to experience pain in the upper right abdominal quadrant and dyspnea on exertion. In September 1928 the dyspnea became more marked, and there was edema of both legs and cyanosis of the mucous membranes. These symptoms increased in severity and on November 4, thirteen months after being discharged from the hospital, he was readmitted. This time he was found to have an empyema of the right pleural cavity, edema of the lower extremities, sacrum and genitalia, an enlarged liver and an enlarged heart. Myocardial damage and abnormally dominant action of the left ventricle were displayed in the electrocardiogram. The blood pressure on admission was 140 systolic, 100 diastolic, and subsequently, November 28, it was 142/60 in the right arm and 160/60 in the left. The arteries in the left axillary space and posteriorly just below the scapulae were much enlarged and tortuous, standing out like whipcords. The pulsations and murmurs in the suprascapular regions were not so marked as on the previous admission. The femoral pulses scarcely could be made out. Dr. J. B. Herrick in consultation diagnosed coarctation of the aorta because of the strong and plainly visible character of the pulses in the upper part of the body and the diminution of the femoral pulses.

After the chest had been aspirated several times, drainage of the empyema by the open method was established by Dr. Arthur Dean Bevan. The patient left the hospital, Feb. 28, 1929, with marked improvement in the pulmonary condition.

October 30, just about one year after his second admission, the patient was readmitted because of precordial distress noted particularly after exertion, and hematemesis. The latter had occurred on three different occasions. He was acutely ill, dyspneic, anemic and restless. Marked carotid pulsations were

From the Presbyterian Hospital and the Norman Bridge Laboratory of Pathology, Rush Medical College.

1. Hamilton, W. F., and Abbott, Maude E.: Am. Heart J. 3: 392 (April) 1928.
2. Evans, William: Quart. J. Med. 2: 1 (Jan.) 1933.

noted. The heart rhythm was absolutely irregular. The hemoglobin was 36 per cent of normal, red blood cells numbered 1,680,000 per cubic millimeter, and there was blood in the stools. In the electrocardiogram, auriculoventricular conduction was prolonged to 0.22 second; there was left axis deviation, simple tachycardia, left ventricle and right ventricle extrasystoles, and auricular hypertrophy. A roentgenogram of the chest showed the heart markedly enlarged in the region of the left ventricle, infiltration of the lower right lobe with interlobar pleurisy at the level of the fourth rib anteriorly, thickened pleura, and adhesions to the diaphragm. A gastro-intestinal series of roentgenograms was reported negative.

November 5 he vomited 500 cc. of bright red blood. November 13 there was another severe similar hemorrhage, and on November 14 he died six hours after a third hematemesis.

Autopsy (Dr. C. A. Apfelbach).—The body weighed 125 pounds (56.7 Kg.). The left side of the thorax was more prominent than the right, and a line drawn through the middle of the sternum curved to the left. A scar, 4 cm. long, was present below the lower border of the right scapula. The teeth at their junction with the gums were covered with clotted blood.

Circumferences of the Mouths of Arteries Forming the Collateral System

	Right	Left
Innominate	6.0 cm.	
Common carotid	3.0 cm.	2.5 cm.
Subclavian	3.0 cm.	5.0 cm.
Internal mammary	0.9 cm.	2.0 cm.
Costocervical trunk	0.5 cm.	0.8 cm.
Thyrocervical trunk	0.8 cm.	1.6 cm.
First intercostal	1.2 cm.	1.2 cm.
Second intercostal	1.0 cm.	1.0 cm.
Third intercostal	1.0 cm.	1.0 cm.
Esophageal	0.5 cm.	0.5 cm.

The abdominal cavity was small, measuring 24 cm. from the superior border of the symphysis pubis to the tip of the xiphoid process, whereas the length of the thorax from the root of the neck to the tip of the xiphoid process was 24.5 cm. The left lung was free. Fibrous adhesions, especially firm close to the spine, obliterated the right pleural cavity. The stomach contained foul smelling, dark purple-brown fluid and clotted blood.

The aorta, 18.2 cm. beyond its cusps, was constricted. There was no remnant of a ductus arteriosus. The lumen of the aorta at the constriction ended in a pouch directed downward and to the right. The wall of the aorta thickened gradually from the junction of the arch and thoracic portions to a maximum width at the point of occlusion of 4 mm. The septum at the apex of the pouch was less than 1 mm. thick and was soft and gray-green. Immediately distal to the coarctation, the aorta was bound firmly to a gray-red and gray-green abscess 6 cm. in diameter, adherent to the bodies of the fourth and fifth vertebrae, the posterior wall of the aorta, the esophagus, and the trachea at its bifurcation. A portion of the right posterior wall of the aorta was torn in freeing the abscess from the vertebrae, and a gray-green, soft walled cavity containing purulent fluid and a friable blood clot was opened. The wall of the aorta where it formed the posterior wall of the cavity, a region 3.5 cm. in diameter, was soft, friable, gray-green and adherent to the blood clot contained within the cavity. Many gray-red thrombi, from 1 to 2 mm. in diameter, were adherent to the inner surface of the aorta in this region. The esophagus formed a portion of the wall of the cavity 1.5 cm. in diameter and its wall was soft, friable, gray-green and adherent to the blood clot. The lymph nodes in this region were heavily loaded with black pigment and a purulent fluid appeared at once on surfaces made by cutting.

The circumference of the root of the aorta was 9 cm., its wall 2 mm. thick. Eight centimeters distal to the attachment of the cusps, the ascending aorta was 7 cm. in circumference; the transverse portion averaged 9.5 cm. The circumferences of the mouths of the arteries forming the collateral system are shown in the accompanying table. The inner surfaces of the larger arteries were altered by slightly elevated, gray-yellow to bright yellow plaques, some of which were calcified.

Distal to the occlusion the abdominal aorta was 6 cm. in circumference, and it narrowed gradually to 3.5 cm. at the mouths of the renal arteries and to 2.5 cm. at the bifurcation.

The heart weighed 610 Gm. There were multiple scars beneath the epicardium and there was a sacculation at the apex 1 cm. in diameter and 1 cm. in depth. The cavity of the right ventricle was 10 cm. long and the wall varied in thickness from 9 mm. at the base to 3 mm. at the apex. The endocardium of the left ventricle was dull gray-white and opaque and averaged about 0.5 mm. in thickness. There was a bright yellow calcified region 5 mm. long and 2 mm. wide at the auriculoventricular junction and an elevated, gray-white plaque 9 mm. in diameter 2 cm. from the junction of the right and posterior aortic cusps. The aortic cusps were less than 1 mm. thick, smooth and glistening. There were two fenestrations of the left cusp distal to the line of contact with the right, each about 2 mm. in diameter. The left and right cusps were fused along their free margins for 6 mm.; the right and posterior cusps for 2 mm. There was a sacculation of the aorta at the apex of the right sinus of Valsalva 5 mm. in diameter and 3 mm. deep. The walls of the coronary arteries were slightly thickened and there were yellow plaques from 2 to 3 mm. in diameter at their mouths. The thickness of the wall of the left ventricle varied from 2 cm. at the base to 2 mm. at the apex.

Except for marked coal pigmentation and cirrhosis of the liver, which has been reported elsewhere,[3] and for coal pigmentation of the spleen, there was no change of interest in the remaining organs.

In the microscopic sections, the walls of the aorta and the esophagus were necrotic, and scattered through them were occasional small clumps of bacteria, both cocci and bacilli, and blood pigment.

The anatomic diagnosis was coarctation of the aorta; gangrenous abscess of the mediastinum communicating with the thoracic portion of the aorta and esophagus; marked compensatory dilatation of the innominate, carotid, subclavian, internal mammary, and upper intercostal arteries; hypertrophy of the heart; empyema scars of the right pleural cavity; extreme coal pigmentation of the lungs, tracheobronchial lymph glands, and spleen; coal pigmentation and cirrhosis of the liver; blood in the stomach and small bowel and marked general anemia.

GARGLING AND THROAT IRRIGATION

WILLIAM SNOW, M.D., AND J. E. STERN, M.D., NEW YORK

It seems that the value of gargles remains an undecided matter in the minds of physicians who have given the subject their attention. For this reason and because of extensive exploitation of gargles by advertisers to the lay public, we undertook objective studies of the comparative value of gargles and throat irrigations.

For these observations, subjects used a thin liquid suspension of barium sulphate while lateral x-ray views of the head and neck were made. The first methods included (1) violent gargling, (2) gentle gargling and (3) tilting the head backward and allowing the suspension to run as far backward as possible without gargling. A study of the films showed that with all these methods the tongue is firmly pressed against the soft palate in such a position that the liquid cannot reach the anterior faucial pillars. Occasionally if the subject interrupted the procedure to take a breath of air a small stream of the mixture leaked backward and then had to be swallowed.

Further observations were made in which gravity irrigations were used with the head and neck flexed. The fluid ran from a container placed 18 inches above the mouth through a length of rubber tubing and a narrow irrigating tip. Study of the films showed that the hypopharynx, oropharynx and nasopharynx were thoroughly irrigated; in fact, frequently some of the fluid ran out of the nose. With this method the swallowing reflex was not evoked.

CONCLUSIONS

These observations lead us to believe that gargling is ineffective and should be replaced by the gravity irrigation method. This method has of course been used by a number of able physicians for many years.

941 Park Avenue.

3. Robertson, S. H.: Tr. Chicago Path. Soc. **13**: 317, 1927-1931.

Therapeutics

THE THERAPY OF THE COOK COUNTY HOSPITAL

EDITED BY BERNARD FANTUS, M.D.
CHICAGO

NOTE.—*In their elaboration, these articles are submitted to the members of the attending staff of the Cook County Hospital by the director of therapeutics, Dr. Bernard Fantus. The views expressed by various members are incorporated in the final draft prepared for publication. The series of articles will be continued from time to time in these columns.*—ED.

THERAPY OF THE MYCOSES

TINEA VERSICOLOR AND ERYTHRASMA

These dermal mycoses differ from trichophytosis in their noninflammatory character. While tinea versicolor and erythrasma differ from each other in exciting cause and clinical characteristics, their treatment is the same. The latter is somewhat more resistant to treatment than the former.

Cleansing.—A hot bath is given and rubbing with soap, preferably Liniment of Soft Soap or a laundry soap, and using a nail brush, then drying and applying.

Parasiticide.—A 5 per cent aqueous solution of sodium thiosulphate is thoroughly applied to the patches by means of a flannel cloth. This is followed by a 3 per cent aqueous solution of tartaric acid, also vigorously rubbed in with a flannel cloth. In this manner nascent sulphur and sulphurous acid are produced. The treatment employed nightly for one week usually brings about a cure, provided fresh underclothing is applied and care is taken to disinfect the infected underclothing thoroughly, as by boiling. These measures are required to prevent recurrence.

TRICHOPHYTOSIS (RINGWORM)

The diagnosis is generally suggested by the characteristic appearance of the lesions and may be made certain by microscopic examination of scrapings or of hair placed on a slide with a few drops of 15 per cent solution of sodium hydroxide on which a cover glass is pressed firmly. The Giemsa stain brings out the details.

Owing to fundamental difference in technic, the therapy of trichophytosis is discussed under three headings: ringworm of the nonhairy parts, ringworm of the hairy parts, and ringworm of the nails.

Ringworm of the Nonhairy Parts.—Prophylaxis: Foot coverings should be constantly worn when the feet are liable to be exposed to contact with infected moist places, such as those around swimming pools. Sodium thiosulphate 10 per cent solution or, better, a powder

PRESCRIPTION 1.—*Thiosulphate Dusting Powder*

℞	Sodium thiosulphate	6.00 Gm.
	Boric acid	24.00 Gm.
M.	Label: Dusting powder (prophylatic).	

containing 20 per cent of sodium thiosulphate in boric acid (prescription 1), should be applied to the feet and footwear after bathing, or morning and evening. Shoes may be disinfected by placing in them a piece of blotting paper on which a teaspoonful of Solution of Formaldehyde is poured. They are kept wrapped for twenty-four hours and then aired thoroughly. Corrosive Mercuric Chloride solution, 1:1,000 for twenty-four hours, disinfects clothing, which should be washed before and after the disinfection.

Treatment: To get rid of the parasites, exfoliation of the affected epidermis is generally required. Agents strong enough to effect this are not tolerated by an acutely inflamed skin. Therefore, when eczematoid dermatitis is present, this must first be treated (see Eczema). Only after the acute inflammation has subsided may remedies be applied that are strong enough to effect a cure. To prevent relapses, which are very liable to occur, the measures listed under "prophylaxis" should be employed. It is especially important to keep the parts dry as much as possible. Hyperhidrosis (q. v.) may require special treatment.

Washing frequently with soap and water will remove scales, mycelia and spores. Green soap may be used in sluggish cases.

Desquamation is required for disinfection, as the mycelia have invaded the epidermis. This may be induced by the ethyl chloride spray, salicylic acid, silver nitrate, solution of formaldehyde or roentgenotherapy.

The Ethyl Chloride spray may be used to freeze not only the affected area but well beyond the border of the lesion, the tissue being maintained in a frozen condition (snow white) for from one-half to one minute. Prior to the application, loose skin edges or overhanging margins should be trimmed away. When, after a period of from five to seven days, the reactionary phenomena have subsided, the treatment may be repeated, if required.

PRESCRIPTION 2.—*Salicylic Acid Lotion*

℞	Salicylic acid	6.00 Gm.
	Alcohol to make	60.00 cc.
M.	Label: Apply locally.	

It is important that Salicylic Acid, 10 per cent in alcohol (prescription 2), or any other discutient application be made well beyond the visibly affected area, for this usually also lodges parasites.

Silver Nitrate cauterization is utilized for deep fissures.

Solution of Formaldehyde, lightly swabbed on, is so powerful that it should be employed only in lesions of a very sluggish type. Its application may be preceded and followed after two or three minutes by 2.5 per cent Phenol solution, to lessen its painfulness.

Roentgenotherapy is not required in the superficial form. It should be reserved for the keratotic and verrucous types, in which it is administered in large doses preferably, 85 kilovolts, 5 milliamperes, 50 cm. distance and 400 roentgens. This should not be repeated for three weeks. Roentgen therapy must not be employed until all irritation from powerful chemicals has subsided. Only soothing applications, such as Calamine Lotion, are permissible between the applications.

Soothing applications may be employed in the intervals between irritative treatments: Talcum or, if considerable irritation has resulted, Zinc Paste dusted with Talcum.

Ringworm of the Hairy Parts.—Prophylaxis: Ringworm of the scalp, which occurs almost exclusively in children, should be prevented from affecting other children by isolation of the patient or, at least, by the patient's constantly wearing a close fitting cap. Combings should be burned and toilet articles disinfected by Compound Solution of Cresol diluted to 5 per cent strength. Ringworm of the beard should be prevented by tonsorial asepsis.

Treatment: 1. Temporary epilation is an essential preliminary to cure in this obstinate and troublesome affliction.

(*a*) Roentgen epilation occurs from seventeen to twenty-one days after appropriate irradiation and lasts for two or three months. As this treatment is very exacting and should be carried out only by an expert, the technic is not given here. One must wait at least two weeks after irritative applications before undertaking irradiation.

(*b*) Manual epilation is much more troublesome and painful and requires months or years for cure. Hair in the affected area and around the margin must be pulled out with tweezers and the rest of the hair clipped close or shaved.

(*c*) Thallium epilation is probably too toxic to be recommended.

Cleansing by a daily shampoo with soap and hot water should be begun after the crusts have been softened with oil or a starch poultice. Liniment of Soft Soap is very effective but probably too irritative to be used daily. After the cleansing, the part is thoroughly dried and parasiticidal ointment or lotion is applied.

In ringworm of the hairy parts, ointments are superior to lotions as the administration form for parasiticides: they penetrate better and can be kept in constant contact with the affected area. They are best applied over night. During the day, lotions may be preferred. They should be alcoholic, ethereal or chloroformic rather than aqueous, because the former penetrate the hair follicles more readily. Success probably depends more on thoroughness, perseverance and intelligence of application than on the particular germicide selected.

For ointments, one may choose Iodine Ointment (U. S. P.), sulphur ointment (prescription 3), or compound benzoic acid (Whitfield's) ointment (prescription 4) and in obstinate cases chrysarobin ointment (prescription 5). The latter must be employed with care against getting it in the eyes. In the case of Whitfield's ointment it may well be asked whether 10 per cent of either salicylic acid or benzoic acid might not be as good, and this question should be settled by clinical study, as the first law of rational combining in prescriptions postulates that the reason for the presence of each and every ingredient in a prescription must be definitely understood.

PRESCRIPTION 3.—*Sulphur Ointment*

℞	Precipitated sulphur	1.50 Gm.
	Petrolatum	30.00 Gm.

M. and Label: Rub in gently once or twice daily. Strength may gradually be increased up to 20 per cent.

PRESCRIPTION 4.—*Compound Benzoic Acid Ointment*

℞	Salicylic acid	1.00 Gm.
	Benzoic acid	2.00 Gm.
	Ointment of rose water	30.00 Gm.

M. and Label: Apply locally twice daily. Strength may be doubled, if necessary.

Note: The effect of this should be compared with that of a 10 per cent ointment of either of the ingredients, to determine whether there lies any special virtue in this particular combination, which may well be doubted.

PRESCRIPTION 5.—*Chrysarobin Ointment*

℞	Chrysarobin	1.50 Gm.
	Petrolatum	30.00 Gm.

M. and Label: Apply with care against getting it in the eyes.

PRESCRIPTION 6.—*Salicylic Acid Pigment*

℞	Salicylic acid	1.50 Gm.
	Chloroform	30.00 cc.

M. and Label: Paint on affected area twice daily until desquamation occurs.

As a lotion, Tincture of Iodine in full strength or diluted may be painted on once or twice daily. Or else chloroformic solution of salicylic acid (prescription 6) may be painted on until desquamation occurs.

Ringworm of the Nails.—This localization is of importance, because it may act as a focus of infection for other portions of the body or other persons.

The nail should be removed as far as possible by trimming off as much as one can without pain by means of knife or scissors, softening the remainder with Solution of Potassium Hydroxide and scraping it thin with a knife blade or a piece of glass. In obstinate cases, surgical removal of the nail (preferably under gas-oxygen anesthesia) is necessary.

PRESCRIPTION 7.—*Corrosive Sublimate Lotion*

℞	Corrosive mercuric chloride	0.06 Gm.
	Alcohol	30.00 Gm.

M. and Label: Apply after softening nail.

The affected area should be soaked twice daily with alcoholic solution of mercuric chloride (prescription 7) and dried, and Ointment of Ammoniated Mercury (half to full strength) and a protective dressing applied.

BLASTOMYCOSIS, SPOROTRICHOSIS AND ACTINOMYCOSIS

Diagnosis.—The possibility of these mycoses should always be borne in mind in chronic, torpid infectious granulomas simulating tuberculosis, syphilis, sarcoma or carcinoma but with a tendency to suppurative degeneration and fistula formation. Subjective symptoms are remarkably slight, excepting such as are caused by secondary pus infection. These three diseases are dealt with here under one heading, as the therapy of these conditions is very similar. In all three of these, the infection may be confined to the skin, which is the most common localization of blastomycosis. It may invade the subcutaneous tissue, which is the usual localization of sporotrichosis; or it may involve the deeper tissues of the body, an invasion that occurs most commonly in actinomycosis, which generally affects the head and neck but may attack the abdominal or the thoracic organs, while primary cutaneous actinomycosis is rare. Pulmonary as well as systemic dissemination of blastomycosis or of sporotrichosis is rare, fortunately, as it is nearly always fatal.

Blastomycosis is suggested by patches of papulopustules with elevated violaceous borders in which there are numerous abscesses.

Sporotrichosis is characterized by subcutaneous painless nodules, which slowly enlarge, soften and form cold abscesses and ultimately fistulas, with the possibility of metastatic involvement elsewhere, usually in the form of an ascending lymphangitis.

Actinomycosis should be suspected when there is an indurated swelling in the cervicofacial region, when so-called sulphur granules are noted in the pus, or when a patient suffers from an apparently incurable, chronically draining postappendectomy or other abdominal sinus; also when there is rib destruction with what appears to be a lung abscess.

The finding on microscopic or culture examination of the characteristic fungus in the pus clinches the diagnosis in all these mycoses.

Prophylaxis.—Chewing of straw, weeds or grain must be avoided, as actinomycosis may be contracted thereby.

Treatment.—Iodides in massive doses daily for a long time are the sheet anchor of treatment in these mycoses. From 6 to 12 Gm. daily is usually employed. The Solu-

tion of Potassium Iodide, N. F. (saturated solution), may conveniently be used, starting with 1 cc. in a glassful of milk three times daily after meals and gradually increasing the dosage until the limit of tolerance is reached as indicated by coryza, acne, digestive disturbance, the phenomena of hyperthyroidism or the development of cachexia. The treatment should continue for at least one month after apparent cure, with immediate readministration at indication of relapse.

Roentgen irradiation may be used in a dosage of 140 kilovolts, with 0.25 mm. of copper and 1 mm. of aluminum filtration for relatively superficial lesions to 0.5 mm.

PRESCRIPTION 8.—*Iodine Solution*

℞	Iodine	1.00 Gm.
	Potassium iodide	10.00 Gm.
	Distilled water	500.00 cc.

M. and Label: Use on gauze as moist dressing.

of copper and 1 mm. of aluminum for deep involvement. A sufficient number of portals should be used to secure 300 roentgens at the site of the lesion. Such treatment may be repeated every two weeks for at least six months.

Surgical intervention should be confined to the evacuation of pus, excepting only in cases in which complete extirpation of the lesion is possible. Curettage should be avoided, as it may lead to dissemination of infection. Indeed, evacuation of the pus may be accomplished by mere puncture and aspiration, and the cavity filled with a 1 per cent solution of sodium iodide. Ulcerated lesions may be painted with Tincture of Iodine and dressed with an iodide solution, 1 : 500 (prescription 8).

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY OF THE AMERICAN MEDICAL ASSOCIATION HAS AUTHORIZED PUBLICATION OF THE FOLLOWING ARTICLE.

H. A. CARTER, Secretary.

RESUSCITATION

YANDELL HENDERSON, PH.D.
NEW HAVEN, CONN.

(Concluded from page 754)

ASPHYXIA NEONATORUM [20]

There is no good reason to look, as many writers have done, for any reactions in the neurorespiratory system of a baby, either before or after birth, essentially different from those of an older child or adult. The normal baby starts to breathe under essentially the same stimulus that causes an adult to breathe again after holding his breath. If in the adult the breath holding has been aided by a preliminary period of voluntarily forced ventilation, the analogy is even closer. The reason that the fetus does not breathe in utero is that its blood is too well arterialized to stimulate the fetal neurorespiratory system, which is rather inexcitable so long as the lungs are atelectatic. If respiratory efforts do occur, the thoracic muscles, which are barely strong enough to dilate the lungs with thin air after birth, fail to draw in more than a minute amount of the much less easily inspired amniotic liquor. If some fluid is drawn in, it is quickly absorbed into the blood; for the lungs are by far the most absorptive organs in the body. The particles of meconium sometimes found in the trachea are probably drawn in from the mouth immediately after birth.

When cold water, or even cold air, is suddenly poured over an adult, the cutaneous stimulus causes him to "catch his breath" in a deep and prolonged or even repeated inspiration. Introduction to a cold world induces the same reaction in a normal baby. Its lungs are thus at least partially expanded. So long as they are atelectatic, the lungs send no impulses over the vagi to the respiratory center. But as soon as the lungs are even partially expanded the vagi carry impulses to the respiratory center that call forth the Hering-Breuer reflexes. These are the reflexes that determine the alternation of inspiration and expiration in normal breathing.

If during birth the head of the child is compressed and deformed, and particularly if an intracranial hemorrhage continues the compression of the respiratory center after birth, the blood supply to the center is diminished. If the umbilical cord is partially compressed, the entire body is correspondingly asphyxiated. A formation of lactic acid occurs, the p_H and alkali of the blood are diminished, and the carbon dioxide content, which at first is increased, is later diminished by escape presumably through the placenta. If these conditions are brief, the baby is livid; if they are prolonged, it is pallid. To whatever extent the sensitivity of the respiratory center has been diminished by lack of oxygen, a stronger stimulus in the form of increased pressure of carbon dioxide is needed to excite the neurorespiratory system to activity. Once its activity is induced, the renewed supply of oxygen gradually restores its normal sensitivity. Thereafter, respiration continues under a merely normal amount of carbon dioxide in the blood.

Atelectasis, however, is not so quickly overcome. Even in wholly normal babies the lungs are not fully expanded for hours, days, or even longer. A continuance of atelectatic areas provides conditions favorable for the development of pulmonary infections. The obvious correction is a routine roentgen examination of every baby a few days after birth, or else some dilating treatment without examination. For this purpose most textbooks still recommend that the baby should be made to cry. A much more effective means of accomplishing this end is afforded by repeated brief inhalations of from 5 to 7 per cent carbon dioxide. Herein lies an immediate possibility of a large decrease of the present high mortality of the first month of life.

ANESTHETIC DEPRESSION [20]

Few branches of medicine have made such great advances within the past three decades as has the art of anesthesia. Among these advances, the use of carbon dioxide is preeminent. Every anesthetist now knows that the hyperpnea of the excitement stage of anesthesia decreases the carbon dioxide of the blood and tends to induce failure of breathing under full anesthesia. He knows also that, on the contrary, a moderate amount of rebreathing deepens and steadies respiration. This knowledge and the inhalation of carbon dioxide, when needed, have almost entirely freed surgical anesthesia from what was formerly its continual imminent danger: failure of respiration.

It is not many years since it was a matter of course that after nearly every major operation the patient lay long unconscious, hypopneic and therefore cyanotic, then nauseated and tasting the incompletely exhaled anesthetic for hours. In part these conditions were due to acapnia induced by overbreathing and washing

out of carbon dioxide under the influence of anesthetic excitement and moderate oxygen deficiency. In part they were due also to the acarbia—diminished blood alkali—that asphyxia and acapnia induce. Simultaneously the volume of the circulation was subnormal, owing largely to the stagnation of the blood in atonic tissues.[24]

All these features of depression are now largely avoided by the increasing skill of anesthetists in preventing both anoxia and acapnia. But in extreme cases in which such ill effects do still sometimes occur they are rapidly and largely counteracted by means of inhalation of carbon dioxide. Full deep breathing returns; cyanosis disappears; the tonus of the muscles is recovered; the skin becomes pink as its vessels fill with blood from the previously atonic muscles; the jugular and other superficial veins are again distended, bringing a full supply of blood to the right heart; and with this restoration of the venous return, arterial pressure and a full pulse are reestablished.

Within the last few years yet another benefit accruing from the use of carbon dioxide and prevention of acapnia has come to light. Under acapnia and under any diminution of tonus the so-called vital capacity of the lungs is decreased. After nearly all surgical operations, especially those in the abdomen, the atonic diaphragm is relaxed headward by several centimeters. Under this condition the lungs are partially collapsed and some of the airways may be blocked. The air from the occluded parts of the lungs is soon absorbed and an area of atelectasis or even a massive collapse of one lung results. Prevention of the normal drainage of the lung through the airways permits the development of infection, resulting in what was formerly called "postoperative pneumonia." Now the etiology of postoperative pulmonary complications is understood; and the means of its prevention are available in the restoration of the tonus of the respiratory muscles and dilation of the lungs by full deep breathing.[25]

How far similar measures may aid in pneumonia of nonsurgical origin, particularly in bronchial pneumonia in children, is still undetermined. It appears, however, that the prevention of cyanosis by inhalation of oxygen is beneficial in lobar pneumonia in adults and that the patients do at least as well, perhaps better, if the carbon dioxide exhaled is allowed to accumulate up to at least 1 or 2 per cent in the oxygen tent.[26]

CARBON MONOXIDE ASPHYXIA[27]

The treatment of carbon monoxide asphyxia is now so effectively performed by the rescue crews of city fire and police departments and of gas and electric companies with their inhalators that the main duty of the physician is not to interfere with the artificial respiration. He should not even make a physical examination that requires cessation of artificial respiration, during which the patient may die. He should restrain his impulse to administer hypodermic, intravenous or intracardiac medication of any kind. The claims for methylene blue, lobeline and other drugs of similar properties have been completely disproved both in theory and in practice. Respiratory stimulants are generally cardiac depressants. When administered to a patient in profound respiratory depression they often afford an immediate and striking pharmacologic demonstration, but the patient is much the worse for it the next day.

Carbon monoxide forms only a loose and reversible combination with the hemoglobin of the blood. But until it is displaced, and the oxygen carrying power of the blood is restored, the asphyxial effect continues and is cumulative. The differences between asphyxiation by water—that is, drowning—and prolonged asphyxiation by carbon monoxide are important. Once the man who has been in the water is brought back to fairly normal breathing by means of artificial respiration, especially when supplemented by inhalation, complete recovery is almost certain to follow. In carbon monoxide asphyxia it is only for cases of brief and acute exposure that artificial respiration is an important factor in resuscitation. In cases of prolonged exposure inducing acarbic asphyxia it is only by a rare chance that the victim is found in the brief period—less than ten, or even five minutes—between cessation of respiration and fibrillation and standstill of the heart. After that he is irretrievably dead; before that he is still breathing spontaneously when removed from the poisonous atmosphere. Such cases are numerous, and it is for them that the advance in the technic of resuscitation has made its greatest contribution in the saving of life. They do not need and are little helped by artificial respiration, but they do need inhalational treatment; and in the acarbic or pseudo-acidotic cases it is needed even more than in the cases of apnea after short asphyxiation. To be most beneficial the inhalation must be immediate: on the spot, not after removal to the hospital.

In every large hospital a few years ago, before the city rescue crews were supplied with inhalators, cases of carbon monoxide poisoning were frequently seen in which, even hours after the patients were brought in by the ambulance, they were completely comatose. It was supposed at that time that their blood must still be largely combined with carbon monoxide, and for this reason bleeding and transfusion were sometimes done. Spectroscopic examination showed, however, that even without any treatment whatever most of the carbon monoxide was eliminated from the blood within a few hours. This fact demonstrated the uselessness of late transfusion and it demonstrated much more. Such of these patients as later recovered consciousness suffered acute and prolonged headache and nausea. Some suffered mental or physical impairment. In those who died, autopsy revealed asphyxial injuries in the brain. Thus it became evident that the continuance of the coma is not due to continuance of asphyxia but that it is due to the injury to the nervous system that was developed during the asphyxia. It became evident also that measures for the relief of asphyxia, when applied late, can at best be of relatively slight benefit. The primary object to be aimed at in the treatment of all cases of prolonged asphyxia is to apply inhalational

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25. Coryllos, P. N., and Birnbaum, G. L.: Bronchial Obstruction: Its Relation to Atelectasis, Bronchopneumonia and Lobar Pneumonia, Am. J. Roentgenol. **22**: 401-430 (Nov.) 1929. Brunn, Harold, and Brill, Selling: Observations on Postoperative Atelectasis: Consideration of Some Factors in Its Etiology, Prevention and Treatment, Ann. Surg. **92**: 801 (Nov.) 1930. Henderson, Yandell: Acapnia as a Factor in Postoperative Shock, Atelectasis and Pneumonia, J. A. M. A. **95**: 572 (Aug. 23) 1930.

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treatment for the rapid elimination of carbon monoxide within the shortest possible time after removal of the patient from the poisonous atmosphere.

ASPHYXIA FROM MORPHINE, ALCOHOL, AND OTHER RESPIRATORY DEPRESSANTS

One of the principal effects of morphine is to decrease and, in sufficiently large dosage, finally almost to abolish the sensitivity of the neurorespiratory system to its normal stimulus, carbon dioxide. It is the resulting depression and final cessation of respiration that cause death from anoxia in cases of morphine poisoning. It is probable that many deaths among the newborn are due to the administration of morphine to the mother and the diffusion of the drug through the placenta to the child. The treatment of the resulting neonatal asphyxia has already been discussed.

For adults so long as pulmonary ventilation is maintained, either naturally or artificially, life continues and resuscitation results. If the narcosis is not too intense, it may be combated effectively by inhalation of quite high percentages of carbon dioxide with oxygen. For extreme cases artificial respiration by intratracheal insufflation of oxygen or air, interrupted ten or twelve times a minute, will maintain life. Artificial respiration with the Eve-Cornish tilting board will probably also be found effective.

Patients with alcoholic coma[28] also are rapidly revived and sobered under the increased respiration induced by inhalation of carbon dioxide. It would save trouble and expense if this treatment for alcoholic intoxication was utilized by the police.

CYANIDE ASPHYXIA

Cyanide is now extensively used for the fumigation of buildings, ships, greenhouses and even trees. The canister gas mask affords effective protection against inhalation. Yet moderate degrees of poisoning are fairly frequent, and severe or even fatal cases occur often enough to be important.

The action of cyanide in the body is to induce asphyxia by inhibiting the respiratory ferment in the cells of the tissues. As the poison is extremely volatile, it is not only rapidly absorbed but may also be equally rapidly eliminated through the lungs. The treatment of slight cases, as recommended by Dr. C. L. Williams[29] of the U. S. Quarantine Station at New York, is therefore "fresh air and plenty of it." In cases that have progressed to apnea, artificial respiration should also be immediately applied. As cyanide is a powerful respiratory stimulant, the victim, during the asphyxiation, will have developed some degree of acapnia. To counteract this condition and hasten elimination of the poison, carbon dioxide diluted in air or in oxygen should be given by inhalation.

Treatment by intravenous infusion has some advocates. It is based on the fact that methemoglobin combines with cyanide. The substances injected are therefore such drugs as are known to convert hemoglobin into methemoglobin. Hug[30] advocates alternating injections of sodium nitrite and sodium thiosulphate. It seems to me, however, that, especially when the poison has been absorbed through the lungs, it is better to promote elimination by active pulmonary ventilation than to attempt to fix it in a combination in the blood.

In adopting measures of resuscitation, it is important to choose those that themselves involve no subsequent ill effects.

PULMONARY EDEMA FROM IRRITANT GASES[31]

The edema of the lungs induced by irritant gases results in asphyxia. It is chiefly a problem of war. But in the industries of peace also many cases occur in which the victims have inhaled ammonia, sulphur dioxide, chlorine, the fumes of various acids, phosgene, or the oxides of nitrogen. The irritant effects of the first four manifest themselves immediately and thus give warning for escape. Phosgene, on the contrary, and especially the oxides of nitrogen, whether from the spilling of nitric acid on wood, from the fumes of explosives, or from burning celluloid, are of less immediate choking character but are of much more serious subsequent effect. Hours after exposure to these gases pulmonary edema may develop, and the victim may drown slowly in the fluid exuding into his lungs.

For the prevention and treatment of pulmonary edema after inhalation of any irritant gas, the first essential is absolute rest for from twenty-four to forty-eight hours. The patient, even though in no apparent danger of developing edema, should be kept in bed; and if any indications of edema have appeared, he should on no account be allowed even to sit up in bed. If asked to sit up for auscultation, he may do so and an instant later fall back dead.

The asphyxia from pulmonary edema may take either of two forms, or one may follow the other: a gray and shocklike form, and a cyanotic form with extreme venous congestion. The gray state involves deficiency of oxygen in the blood without retention of carbon dioxide; or there may even be some degree of acapnia. The congested state develops when the lungs are waterlogged to such a degree that not only oxygen cannot pass in but also the much more easily diffusible carbon dioxide cannot pass out. The resulting hypercapnia and the obstruction to the flow of blood through the lungs are the joint causes of the venous congestion and overloaded heart.

For both conditions oxygen should be administered continuously in a concentration sufficient, if possible, to overcome cyanosis. Carbon dioxide inhalation tends to revive the patient from the stuporous condition induced by asphyxia, but it does not prevent the further development of asphyxia. It may even increase the venous congestion and should therefore not be administered in the stage of venous congestion.

The venous congestion may be treated by bleeding, after which intravenous infusion of saline solution has been recommended.[32] But the chief point to be aimed at is absolute quiescence, for any severe degree of

28. Hunter, F. T., and Mudd, S. G.: Carbon Dioxide Treatment in Acute Alcoholic Intoxication, Boston M. & S. J. **190**: 971 (June 5) 1924; Treatment of Acute Alcoholic Intoxication, editorial, J. A. M. A. **83**: 199 (July 19) 1924.

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30. Hug, Enrique: Treatment of Hydrocyanic Acid Poisoning, Buenos Aires letter, J. A. M. A. **102**:552 (Feb. 17) 1934.

31. Henderson, Yandell, and Haggard, H. W.: Noxious Gases and the Principles of Respiration Influencing Their Action, American Chemical Society Monograph Series, New York, Chemical Catalog Company, 1927.

32. Underhill, F. P.: The Experimental Treatment of Poisoning by Lung Irritant or Suffocant Gases, Med. Dept. of the U. S. Army in the World War, vol. 14, Medical Aspects of Gas Warfare, chapter 19, pp. 680-712, Washington, D. C., Government Printing Office, 1926.

pulmonary edema generally results fatally in spite of any treatment.

Surgeons, who during war become accustomed to seeing huge physical injuries, are shocked by the appearance of patients gasping in pulmonary edema. Yet in fact such patients are so far anesthetized by asphyxia that they actually suffer far less than those with severe gunshot wounds.

HEMORRHAGE AS A FORM OF ASPHYXIA [33]

Hemorrhage produces its ill effects largely through asphyxia. This is tacitly recognized by surgeons in their preference for transfusion of blood over any mere infusion of a saline or gum solution. The victim of acute exsanguination exhibits air hunger. In less extreme cases the volume of breathing increases with the loss of blood in a manner closely similar to the progressively developing hyperpnea in a man or animal undergoing carbon monoxide asphyxia.

All these facts point to the loss of the red corpuscles as an important feature of hemorrhage. The effect is essentially like the abolition of the oxygen carrying power of the corpuscles by carbon monoxide. This statement does not deny that the diminution of blood volume also impairs the circulation. But simple decrease of blood volume, such as is induced by the diarrhea of cholera, is effectively combated by intravenous infusion of saline solution. Hemorrhage, on the contrary, is only partially and temporarily relieved by restoration of blood volume. For effective relief and the return of normal quiet breathing, restoration of the oxygen carrying power of the blood by restoration of the supply of hemoglobin containing corpuscles is essential.

If, then, hemorrhage is largely a form of asphyxia, the obvious first aid measure is to administer oxygen and to maintain this inhalation by means of an inhalator, a tent, a metabolism apparatus or an anesthesia apparatus supplying oxygen, until transfusion can be performed. Patients with hemorrhage, if left for even a short time without oxygen inhalation or transfusion, develop acarbia. But until the oxygen carrying power of the blood is restored, carbon dioxide is probably best not used. Exsanguinated animals were found by Henderson and Haggard [33] to react badly to inhalation of carbon dioxide. The exsanguinated man or animal cannot overcome even a pseudo-acidosis—that is, acarbia—without restoration of the red corpuscles. Carbon dioxide may prolong life but it cannot recall a normal amount of alkali to the blood except in the presence of an ample supply of oxygen to the tissues.

The main point to be emphasized is this: After a severe hemorrhage it is not enough to stop the loss of blood and to prepare for a transfusion. Until the transfusion can be performed, and even thereafter, oxygen should be continuously administered. Hemorrhagic asphyxia should not be allowed to continue for a minute longer than can possibly be avoided. In all forms of asphyxia, measures of resuscitation, in order to be most effective, must be immediate.

FAILURE OF THE CIRCULATION AS A CAUSE OF ASPHYXIA

Surgical and traumatic shock has long been recognized as involving depression and finally failure of the circulation. A condition results similar in appearance to that induced by hemorrhage, involving a deficient supply of oxygen to the tissues and the usual consequences of such deficiency: acapnia, acarbia and pseudo-acidosis.

In shock without hemorrhage there is, however, no loss of red corpuscles from the body, and the blood alkali is merely displaced. Both corpuscles and alkali may be recalled into use.[34] To effect such recall, both the asphyxia and the acarbia may be combated with inhalation of carbon dioxide and oxygen.

One of the oldest and also the latest of many conceptions of the underlying cause of the depression of the circulation in shock [24] and in illness is that the tonus of all the muscles of the body, both skeletal and visceral, is depressed, and that the blood stagnates in the atonic tissues. Stimulation of respiration with carbon dioxide increases the effective difference of pressure between the tissues of the body and the thorax and thus promotes the venous return to the heart.

In the large majority of all deaths, whatever the initial cause, the sequence is that of increasing weakness, decreasing tonus and failing circulation. The terminal gasps and "death rattle" express the final reaction of the neurorespiratory system to asphyxia.

SUMMARY

The conditions to which resuscitation applies are all essentially forms of asphyxia. They include drowning, electric shock, asphyxia of the new-born, carbon monoxide, morphine, cyanide and alcohol poisoning, anesthetic and postoperative depression, pulmonary edema and hemorrhage.

For brief complete asphyxia, involving failure of breathing, the principal measure of resuscitation is artificial respiration, reinforced by inhalation of carbon dioxide and oxygen.

For prolonged asphyxia, inducing coma with depression of breathing, the principal measure of resuscitation is inhalation of carbon dioxide and oxygen, initiated, when needed, by artificial respiration.

The various forms of apparatus for treatment of asphyxia are here evaluated. Artificial respiration apparatus of the laboratory type should be available in the operating room. But such apparatus is not suitable for general use by laymen. Outside the operating room and the hospital, reliance should be placed on inhalators and the Schafer prone pressure method of artificial respiration.

The theory of asphyxia now generally accepted in the medical sciences is inconsistent with the facts of resuscitation established clinically. If the condition now called "acidosis" were really acid poisoning, inhalation of carbon dioxide would further poison the victims of asphyxia. The fact is, on the contrary, that carbon dioxide combined with a supply of oxygen has proved to be the specific cure for asphyxial "acidosis." For further progress in resuscitation and in related problems of clinical physiology the development of a sound theory of asphyxia, and of "acidosis," or acarbia, is urgently needed.

33. Henderson, Yandell, and Haggard, W. H.: Hemorrhage as a Form of Asphyxia, J. A. M. A. **78**: 697 (March 11) 1922.

34. Henderson, Yandell; Haggard, H. W., and Coburn, R. C.: The Therapeutic Use of Carbon Dioxide After Anesthesia and Operation, J. A. M. A. **74**: 783 (March 20) 1920. Henderson, Yandell: Acapnia as a Factor in Postoperative Shock, Atelectasis and Pneumonia, ibid. **95**: 572 (Aug. 23) 1930. Kroetz, C.: Sauerstoff- und Kohlensäureatmung in ihrem Einfluss auf den Kreislauf bei Gesunden und Kreislaufkranken, Ztschr. f. Kreislaufforschung **22**: 641-645, 1930.

Committee on Foods

THE COMMITTEE HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT. RAYMOND HERTWIG, Secretary.

NOT ACCEPTABLE

FONTANA'S MUSHROOM GRAVY

The Fontana Food Products Company of San Francisco submitted to the Committee a product called "Fontana's Mushroom Gravy" prepared from tomato purée, water, olive oil, onions, meat (United States government inspected and passed), white wine, celery, flour, salt, carrots, dried French mushrooms, sugar, parsley, butter, pepper, garlic, rosemary and bay leaf.

Analysis (submitted by manufacturer).—	per cent
Moisture	85.1
Ash	2.5
Sodium chloride	2.0
Fat (ether extract)	2.6
Protein (N × 6.25)	2.5
Crude fiber	0.6
Carbohydrates other than crude fiber (by difference)	6.7

Discussion of Label and Name.—The name "Mushroom Gravy" implies that mushrooms are the principal ingredient, giving the product the food and flavor values of mushrooms, whereas they are present in insignificant quantity only. Food names should truthfully and appropriately identify the nature or ingredients of foods. The label statement "Choice mushrooms, meat, ripe tomatoes, pure olive oil, vegetables and spices" incompletely lists the ingredients and, by giving first place to mushrooms and meat, unduly emphasizes their quantitative importance as components of the product. Descriptive statements of compounded foods should list all ingredients in order of decreasing proportions to be truthful and to properly indicate their relative quantities. Incomplete statements giving first place to ingredients occurring in minor proportion deceive as to the true nature and composition of foods. Illustrations of certain of the ingredients on the label and the omission of others add to the misleading nature of the label. Food manufacturers are obligated to name their products and design their labels so that the public may be truthfully informed in statement and by implication.

The company was advised of the Committee's criticisms of the deceptive name and label but has not demonstrated willingness to make the desired changes. This product, therefore, will not be listed among the Committee's accepted foods.

ACCEPTED FOODS

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COMMITTEE ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOLLOWING ANY NECESSARY CORRECTIONS OF THE LABELS AND ADVERTISING TO CONFORM TO THE RULES AND REGULATIONS. THESE PRODUCTS ARE APPROVED FOR ADVERTISING IN THE PUBLICATIONS OF THE AMERICAN MEDICAL ASSOCIATION, AND FOR GENERAL PROMULGATION TO THE PUBLIC. THEY WILL BE INCLUDED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED BY THE AMERICAN MEDICAL ASSOCIATION.

RAYMOND HERTWIG, Secretary.

JACOB MUSHROOMS

BROTH—FANCY BUTTONS—SLICED—SLICED STEMS AND PIECES

Manufacturer.—Edward H. Jacob, Inc., West Chester, Pa.

Description.—Hot house mushrooms; respectively broth, buttons, sliced, and sliced stems and pieces.

Manufacture.—Culture: Mushroom spores obtained by careful collection under sterile conditions from mushrooms of desired color, flavor and texture are used to innoculate a "master jar" containing properly prepared and composted autoclaved manure. Spawn from the master jar is used to inoculate other similarly prepared jars. Specially prepared manure beds (21 C.) are planted with the spawn, which rapidly runs through the compost, and after three weeks a one inch layer of dirt is laid over the compost. When the mushroom crop is desired, the bed is watered and the temperature maintained at about 11 C. The mushrooms are picked daily and transferred to the packing plant. The growing season runs from October to June.

Manure Beds: For preparing the manure beds, manure from urban areas is carefully composted and turned several times until ready for use in the growing beds, which are arranged in two tiers in special mushroom houses without windows and with controlled ventilation. The beds are set to a depth of 8 inches with incompletely decomposed manure. The houses are tightly closed and the ventilation is controlled. The temperature of the compost rises to 54 C. and is maintained there for several days. Insects and disease producing organisms are killed and the moisture content adjusts itself to a desired level. When the temperature drops to 21 C. the beds are ready for planting with spawn.

Preparation and Canning: The mushrooms are screened to remove adhering dirt, the stems are cut off at the proper point, and the stems and buttons are separated. The buttons are washed in rapidly circulating water, sorted according to size, inspected (imperfect and blemished pieces are removed), and blanched and shrunk in live steam. The condensed steam constitutes the broth in which the mushrooms are packed. The mushrooms are cooled in water and are drained and packed in tins with the broth, which has been salted and heated to 88 C. The cans are automatically capped, processed for twenty minutes under 15 pounds steam pressure, and cooled.

The mushroom pieces and stems are prepared, canned and processed in the same general manner as the buttons. The sliced mushrooms are automatically sliced.

Analyses (submitted by manufacturer).—

Broth	Liquor, per cent
Moisture	96.2
Total solids	3.8
Ash	2.0
Sodium chloride	1.7
Fat (ether extract)	0.3
Protein (N × 6.25)	0.7
Reducing sugars as dextrose	0.0
Reducing sugars, after inversion, as dextrose	0.0
Crude fiber	0.0
Carbohydrates other than crude fiber (by difference)	0.8

Buttons	Mushrooms, per cent	Liquor, per cent
Moisture	89.1	95.8
Total solids	10.9	4.2
Ash	1.8	1.7
Sodium chloride	1.2	1.3
Fat (ether extract)	0.2	0.2
Protein (N × 6.25)	4.5	1.1
Reducing sugars as dextrose	0.0	0.0
Reducing sugars, after inversion, as dextrose	0.0	0.0
Crude fiber	1.2	0.0
Carbohydrates other than crude fiber (by difference)	3.2	1.2
Sliced		
Moisture	88.7	95.8
Total solids	11.3	4.2
Ash	1.6	1.6
Sodium chloride	1.0	1.3
Fat (ether extract)	0.2	0.1
Protein (N × 6.25)	4.4	1.1
Reducing sugars as dextrose	0.0	0.0
Reducing sugars, after inversion, as dextrose	0.0	0.0
Crude fiber	1.3	0.0
Carbohydrates other than crude fiber (by difference)	3.8	1.4
Stems and Pieces		
Moisture	90.9	96.7
Total solids	9.1	3.3
Ash	1.7	1.6
Sodium chloride	1.3	1.3
Fat (ether extract)	0.2	0.1
Protein (N × 6.25)	3.1	0.6
Reducing sugars as dextrose	0.0	0.0
Reducing sugars, after inversion, as dextrose	0.0	0.0
Crude fiber	1.2	0.0
Carbohydrates other than crude fiber (by difference)	2.9	1.0

Calories.—Contains little caloric value.

Claims of Manufacturer.—Grown under carefully controlled conditions.

NORRIS JUVENILE CANDIES

DEXTROSE SPECIAL

Manufacturer.—Norris, Inc., Atlanta, Ga.

Description.—Confections of various shapes, colors and flavors containing dextrose, corn syrup, flavors (true fruit flavors, esters, ethers, lemon, orange and mint oils, and United States Department of Agriculture certified food colors).

Manufacture.—Definite quantities of corn syrup, dextrose and water are heated in a copper steam jacketed vacuum kettle. A "vacuum" of 1½ inches mercury pressure is developed for five minutes, the candy mass is cooled and the flavoring and coloring are worked in. A portion may be pulled. The candy

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mass, maintained at a proper temperature, is worked to a desired condition and passed through brass rolls containing molds. The molded candy is cooled, then steamed and rolled in dextrose and packed in boxes. In the case of lollypops, two pieces, one colored and one pulled to milky whiteness, are pulled together, producing a two color piece, which is clipped up by shears and wooden sticks are inserted.

Analysis (submitted by manufacturer).—

	per cent
Moisture	1.3
Ash	0.2
Fat (ether extract)	0.0
Protein (N × 6.25)	0.0
Reducing sugars as dextrose	85.7
Sucrose (polarization method)	0.0
Dextrins (by difference)	12.8

Calories.—3.9 per gram; 111 per ounce.

KELLOGG'S WHOLE WHEAT BISCUIT

Manufacturer.—Kellogg Company, Inc., Battle Creek, Mich.

Description.—Toasted shredded cooked whole wheat biscuits.

Manufacture.—Washed whole wheat is cooked under steam pressure, partially dried, shredded by grooved rolls, and formed into biscuits which are toasted, dried, cooled and packed in cardboard cartons.

Analysis (submitted by manufacturer).—

	per cent
Moisture	2.2
Total ash	1.7
Sodium chloride	0.2
Fat (ether extraction method)	1.7
Protein (N × 5.7)	10.1
Sucrose	2.0
Crude fiber	2.1
Carbohydrates other than crude fiber (by difference)	82.2
Calcium (Ca)	0.04
Phosphorus (P)	0.38
*Iron (Fe)	0.0067
†Copper (Cu)	0.001

* J. Biol. Chem. **80**: 463 (April) 1930.
† J. Biol. Chem. **81**: 435 (Feb.) 1929.

Calories.—3.8 per gram; 108 per ounce.

TORRINGTON CREAMERY IRRADIATED VITAMIN D PASTEURIZED MILKS—HOMOGENIZED AND REGULAR

Distributor.—Torrington Creamery, Inc., Torrington, Conn.

Description.—Bottled pasteurized homogenized and regular vitamin D milks irradiated with ultraviolet rays (patent No. 1,680,818).

Preparation.—The milk complies with legal requirements and is pasteurized by the standard holding method. For description of irradiation, see THE JOURNAL, Oct. 7, 1933, page 1155. For the homogenized milk, the milk is homogenized under 1,500 pounds pressure per square inch.

Vitamins.—Clinical investigation shows these milks to be reliable antirachitic agents if the proper amount is used. Contain 135 U. S. P. X (Revised, 1934) vitamin D units per quart.

Claims of Distributor.—Irradiated antirachitic pasteurized milks, homogenized and regular, having otherwise the flavor and food values of usual pasteurized milk.

DR. P. PHILLIPS TREE RIPENED ORANGES, TANGERINES AND GRAPEFRUIT

Distributor.—Dr. P. Phillips Company, Orlando, Fla.

Description.—Fresh, tree-ripened oranges, tangerines and grapefruit passing Florida state standards for maturity, and company standards for appearance and eating quality. No arsenical sprays are used.

Cultivation and Harvesting.—The fruit is picked from groves owned by the Dr. Phillips Company and its affiliates or from groves where similar cultural practices approved by the company are observed. So far as is practicable, only uniform fruit, meeting company standards, is packed. Insect and fungus control is obtained by spraying with liquid or dry mixtures of sulphur and lime. Oil-lime-sulphur emulsions may be used also. On rare occasions, with bad infestations of lemon scab, copper sulphate-lime spray is used in the spring but no traces remain at the time of harvesting. No arsenate of lead or other arsenic sprays are used nor any treatments affecting maturity of the fruit.

Ripe fruit is picked by hand, conveyed to the packing house and inspected on belts by graders, who take out rots and misshapen fruit. The good fruit is immersed in warm soap water to loosen any dirt, sprayed with water while passing over rotating brushes, and dried in racks with warm air. Oranges and grapefruit are polished with dry brushes. The fruit is graded on the basis of appearance into bright, russet and golden grades, stamped with the name of Dr. P. Phillips, wrapped in paper, packed in boxes by hand, cooled to 2-3 C. and shipped to the market.

The Dr. Phillips brand fruit must pass maturity and taste tests. Color of the fruit is not a dependable indication of maturity. Picked fruit which does not meet the taste test or which must be artificially colored is packed under other brand names. The Dr. Phillips brand is intended to be a tree ripened mature fruit.

Analysis (submitted by manufacturer).—

	per cent
Oranges	
Moisture	83.2
Ash	0.5
Fat (ether extract)	0.1
Protein (N × 6.25)	0.9
Reducing sugars as invert sugar	9.4
Sucrose	4.9
Crude fiber	0.2
Carbohydrates other than crude fiber (by difference)	14.2
Acidity as citric acid	0.9
Ratio of sugars and acids	12.7 : 1
Tangerines	
Moisture	83.4
Ash	0.5
Fat (ether extract)	0.02
Protein (N × 6.25)	0.7
Reducing sugars as invert sugar	9.6
Sucrose	5.1
Crude fiber	0.2
Carbohydrates other than crude fiber (by difference)	14.7
Acidity as citric acid	0.5
Ratio of sugars and acids	21.7 : 1
Grapefruit	
Moisture	88.7
Ash	0.6
Fat (ether extract)	0.1
Protein (N × 6.25)	0.8
Reducing sugars as invert sugar	5.8
Sucrose	2.5
Crude fiber	0.1
Carbohydrates other than crude fiber (by difference)	8.4
Acidity as citric acid	1.3
Ratio of sugars and acids	7.4 : 1

Calories.—Oranges and tangerines: 0.6 per gram; 17 per ounce. Grapefruit: 0.4 per gram; 11 per ounce.

Claims of Distributor.—Only selected properly handled ripe fruit is packed under the trade name "Dr. Phillips."

GOLDEN BEAR CALIFORNIA PURE ORANGE JUICE

Manufacturer.—Bireley's, Hollywood, Calif.

Description.—Flash pasteurized California Valencia orange juice retaining in large measure the original vitamin content.

Manufacture.—Select tree-ripened Valencia oranges are scrubbed in running water, automatically cut in halves and reamed. The juice is strained (avoiding beating in of air), chilled, flash pasteurized by special equipment, automatically canned, sealed and cooled. The equipment is designed to avoid as much as possible incorporation of air in the juice. The time of pasteurizing and canning is less than two minutes.

The trees are not sprayed with arsenic sprays.

Analysis (submitted by manufacturer).—

	per cent
Moisture	85.3
Ash	0.5
Fat (ether extract)	0.1
Protein (N × 6.25)	1.4
Reducing sugars as invert sugar	8.3
Sucrose (copper reduction method)	3.0
Crude fiber	0.1
Carbohydrates other than crude fiber (by difference)	11.2
Titratable acidity as citric acid	1.4

Calories.—0.6 per gram; 17 per ounce.

Vitamins.—Assay shows retention in high degree of vitamin C content.

Claims of Manufacturer.—Retains practically all the nutritional values of orange juice. For all dietary and table uses.

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SATURDAY, SEPTEMBER 15, 1934

THE GASTRO-INTESTINAL TRACT AND THE AUTONOMIC NERVOUS SYSTEM IN POLIOMYELITIS

One of the curious early manifestations of poliomyelitis is the disturbance of the gastro-intestinal tract. In fact, it was proposed long ago that infantile paralysis is primarily an enteric disease[1] and it was suggested that the infective agent might be carried from the intestinal tract to the central nervous system by way of the sympathetic nerves.[2] These theses were generally held to be untenable because repeated efforts to produce the disease by enteral administration of the virus to monkeys failed,[3] with but few exceptions,[4] which, in view of their rarity, were not given serious consideration. It was assumed therefore that ingestion of the virus probably plays no part in the production of poliomyelitis and that the upper respiratory tract, notably the nasal passages, serves as the chief if not the only portal of entry for the infective agent. When, however, as Clark and his associates[3] have shown, the virus is fed to monkeys or injected directly into a loop of intestine, material recovered later from the feces of these animals, or a dialysate of them, may produce typical poliomyelitis when inoculated into other monkeys. No virus could be recovered from the stools of animals suffering from the active disease produced by intracerebral inoculation.

Recently, Toomey at Western Reserve University has published the results of an extensive series of observations and experiments that indicate the necessity for reconsideration of some of the accepted tenets. He found that definite gastro-intestinal involvement occurs as an early sign in a large majority of patients with poliomyelitis (251 out of 386 cases in his series). In many of these, actual paralysis of the intestine appears to occur; usual measures fail completely to stimulate the bowel.[5] Similarly, disturbances of urinary excretion noted in many patients appear to be referable to transient paralysis of the bladder. Subcutaneous injection into guinea-pigs of fecal emulsions or urine from patients suffering from poliomyelitis caused death in a considerably greater number of animals than did the injection of similar material from normal patients.[6] Lesions observed in the spinal cords of the animals injected with the fecal emulsions from patients with poliomyelitis were strikingly similar to those seen in clinical cases.[7] The previous injection of convalescent serum, but not of normal serum nor of serum obtained during the first few days of the disease, prevented entirely or reduced the severity of the symptoms in the animals.[8] The toxic factor in the stools was readily destroyed by heat and could be removed by filtration. Toomey and von Oettingen[9] have demonstrated that perfusion of the rabbit's intestine in vivo with emulsions of stools from monkeys infected by intracerebral inoculation of poliomyelitis virus, or with the virus itself, produced profound depression of the intestinal musculature so that the latter would not respond even to barium chloride in high concentration, indicating a direct effect on the smooth muscle itself. Incubation of virus with convalescent serum prevented the effect of the enterodepressant factor, but human serum obtained during the acute stages of poliomyelitis or normal monkey serum did not. Whether or not the convalescent serum can neutralize the effect of the enterodepressant fecal factor apparently has not yet been determined. Stools from normal human beings, from the monkeys before they were infected with the virus and from patients with tuberculosis, meningitis, varicella, diphtheria or scarlet fever did not depress the intestine but on the contrary usually stimulated it. Stools from patients with influenza, however, caused definite depression.

Other observations appear further to implicate the intestinal tract in poliomyelitis. The agglutinin titers of the blood serum for organisms of the colon-typhoid group, in patients with the acute disease, were often markedly lower than during convalescence.[10] This was found not to occur in a number of patients suffering from several other acute infectious diseases. As the change in agglutinin titers may have been due either to a diminution from the normal agglutinin level with recovery later or to the development of antibodies to

1. Wickman, Ivar: Acute Poliomyelitis (Heine-Medin's Disease), Washington, D. C., Nervous and Mental Disease Publishing Company, Monograph 16, 1913.

2. Sicard: Presse méd. **2**: 19 (Jan. 11) 1905, cited by Rolleston, J. D.: Brain **29**: 99, 1906.

3. Flexner and Lewis, Amoss, Schultz, Clark and others, cited by Clark, P. F.; Roberts, D. J., and Preston, W. S. Jr.: Passage of Poliomyelitis Virus Through the Intestinal Tract, J. Prev. Med. **6**: 47 (Jan.) 1932.

4. Leiner and von Wiesner; Kling, Levaditi and Lepine, cited by Clark, Roberts and Preston.[3]

5. Toomey, J. A.: The Intestine and Urinary Bladder in Poliomyelitis, Am. J. Dis. Child. **45**: 1211 (June) 1933.

6. Toomey, J. A.: Presence of a Specific Toxic Factor in the Stools and Urines of Poliomyelitis Patients, J. Prev. Med. **6**: 379 (Sept.) 1932.

7. Toomey, J. A.: Pathological Reactions in Guinea-Pigs Injected with Standardized Stool Emulsions from Poliomyelitis Patients, J. Prev. Med. **6**: 387 (Sept.) 1932.

8. Toomey, J. A.: Neutralization Experiments in Poliomyelitis, J. Prev. Med. **6**: 397 (Sept.) 1932.

9. Toomey, J. A., and von Oettingen, W. F.: An Enterodepressant Factor in the Stools and Spinal Cords of Monkeys Infected with Poliomyelitis, Am. J. Dis. Child. **48**: 30 (July) 1934.

10. Toomey, J. A.: Changes in Titers of Agglutinins for Enteric Organisms in the Blood Serum in Poliomyelitis, J. Infect. Dis. **54**: 74 (Jan.-Feb.) 1934.

these organisms de novo, studies were made on monkeys before and after intracerebral inoculation with poliomyelitis virus. It was found that the agglutinin titers dropped sharply in the acute stages of the disease from a previous high level, thus indicating that the former hypothesis is the correct one.

When monkeys are inoculated intracerebrally with poliomyelitis virus, a period of a week or more usually supervenes before paralysis develops. However, virus mixed before injection with combined filtrates of ten day old cultures of organisms of the colon-typhoid group was found to produce hemiparesis in twenty-four hours and quadriplegia in from five to seven days.[11] The filtrates alone did not produce paralysis. On injection of the virus into the lumen of a loop of intestine segregated for a time between two clamps or into the subserosa of the intestine, poliomyelitis regularly supervened. The combination of virus and filtrates in these cases also was found to accelerate the production of the disease.

It is known from the work of Ecker [12] that young culture filtrates of members of the colon-typhoid group are highly toxic and that there are essential differences among the toxic factors produced by the several members of this group (some markedly stimulate the intestine while others have little or no apparent effect).[13] Whether one or more of the several genuses, species and strains of organisms employed by Toomey is responsible for enhancing the effect of the virus, whether young rather than old culture filtrates will produce a similar result, whether there is a specific relationship between the virus and the colon-typhoid organisms, whether this is merely a nonspecific effect of a combination of two poisons—all these questions remain for future experimentation to decide.

Thus the gastro-intestinal tract may be a more important factor in poliomyelitis than has been believed heretofore. From Toomey's experiments it appears certain that poliomyelitis may be produced with the intestinal tract as a portal of entry. It remains yet to be proved beyond doubt that in human cases the intestine is actually the portal of entry. It is necessary to remember that the enteric tract of man has special peculiarities not possessed by those of the lower animals, including monkeys. The fact that a few cases of the disease have been produced in monkeys without resort to Toomey's expedient of isolating a loop of intestine between two clamps indicates that special conditions may make this unnecessary. Presumably this might be the case in man also, though whether more or less often than in monkeys it is impossible to say. The fact, however, that involvement of the sympathetic nervous system has been found to occur early in clinical cases of the disease, often before any involvement of somatic nerves is apparent,[14] adds weight to this argument.

The ingenious and painstaking work of Toomey has revived and to a considerable extent substantiated Sicard's hypothesis that the poison characteristic of poliomyelitis may be absorbed by the gray fibers of the intestine and be carried by way of the sympathetic nerves to the spinal cord; but as with all really productive investigation it has raised many provocative, although as yet unanswerable, questions.

11. Toomey, J. A.: Accelerated Production of Poliomyelitis, Proc. Soc. Exper. Biol. & Med. **31**: 1015 (May) 1934.
12. Ecker, E. E.: The Toxin Produced by B. Paratyphosus B, J. Infect. Dis. **21**: 541 (Dec.) 1917.
13. Ecker, E. E., and Rademaekers, A.: J. Exper. Med. **93**: 785 (June) 1926. Ecker, E. E., and Biskind, M. S.: The Effect of Certain Toxic Substances in Bacterial Cultures on the Intestinal Movement, Arch. Path. **7**: 204 (Feb.) 1929.
14. Toomey, J. A.: Some Reflex Changes in Poliomyelitis, Am. J. Dis. Child. **46**: 730 (Oct.) 1933; Reactions of Patients with Infantile Paralysis to Autonomic Drugs, ibid. **47**: 573 (March) 1934.

CURRENT PRODUCTION AND CONSUMPTION OF MILK

The intimate connection between economic difficulty in one field and the welfare of the individual whose immediate interest is perhaps far removed is illustrated in extreme degree by the dairy farmer on the one hand and the consumer of milk on the other. The importance of devising methods to help the producer is matched by the necessity of keeping available the supply of this indispensable food during these times of stress. Both the layman and the physician are vitally interested in the situation as regards the present supply and the consumption of milk in this country. A recent issue of the *Consumers' Guide*,[1] devoted to a survey of the national milk supply, sets forth certain significant facts.

The number of milk cows in this country has increased every year during the depression and in 1933 reached 26,000,000, the greatest in the history of the country. Two things have occurred which make it appear that there is an oversupply of milk: the price to the producer has dropped and great surpluses of manufactured dairy products have accumulated. Together with an apparent oversupply there is a shrinkage of the market. With the increasing population it is impossible to view this situation with anything but apprehension.

The unique importance of milk in the dietary has been fully established by investigators in nutrition during the past thirty years. Largely through the studies of Sherman and his cogent presentation of the results, there has been given to the human requirement for milk a quantitative expression. A quart of milk per child daily has become a by-word with practical workers in nutrition. How does the current per capita consumption compare with this standard or one based on it? Assuming that adults require less milk than children and that other suitable foods can be substituted in part for milk, the *Consumers' Guide* states that a minimum-cost adequate diet should provide 260 quarts of milk or its equivalent annually. "What we are actually getting is about 191 quarts a person a year—and

1. Consumers' Guide, issued by the Consumers' Counsel of the Agricultural Adjustment Administration **1**, May 28, 1934.

this is an average, which means that lots of people are getting very much less." Similar evidence is provided by statistics issued by the Department of Agriculture;[2] in 1933 the daily per capita consumption of milk and cream in cities and villages was about 154 quarts.

Thus there is considerable discrepancy between the current consumption of milk and what it ought to be according to conservative expert opinion. Furthermore, the *Consumers' Guide* emphasizes the striking fact that, if the estimated liberal or adequate amount of milk were consumed, the present peak number of dairy cows would fall short of the required number by 15,000,000. The economic and, perhaps, political implications of this situation are evident; of fundamental and immediate concern, however, is the public health aspect of the restriction in the consumption of milk.

THE LANGUAGE OF MEDICINE

The language of medicine is ever changing; thousands of words are added to its vocabulary each year. In a recent essay on "Language, Jargon, and Modern Medicine," Dr. Herbert R. Hurter[1] pointed out that even the English terms for "doctor" are not the best possible words for the purpose. He believes that the French *médecin* and the German *arzt* are better than medical practitioner, physician, doctor of medicine, leech, or such horrible terms as mediciner, medico or medic. The most ancient English term was of course "leech," but it lost its value when it was applied much more frequently to the little blood-sucking animal and began, by slang connotation, to become associated with the money lenders. The word "surgeon" has been with the profession 600 years and has been spelled thirty different ways. Etymologically it means a handy man —a well chosen word. The word "physician," it seems, has been spelled with an "f" and even with a "v" and today still includes those who do surgery as well as medicine. The word practitioner goes back certainly as far as four centuries, but general practitioner was not a well established term even eighty years ago.

Dr. Hurter pays special attention to the jargon of medicine. It must be remembered that the jargon and slang of today represent the established usages of the next generation. Yet for the vast majority of people the language of medicine is a closed book and not likely to be brought into daily conversation. New sciences acquire new words and, if the words seem to fit, they quickly come into the language. Almost every one today uses such words as antibody, acidosis, psychoanalysis, vitamin and endocrine, yet not one of these words is even fifty years old.

The main features of jargon in writing are pompous display, the use of long words when short ones are available, circumlocution and verbosity. Thus Hurter points out that the sentence "The nurse gave him morphine hypodermically" is good English and can be understood by every one. However, "He was subjected by the nurse to the administration of a hypodermic injection of morphine" is jargon. Uses of the words "case" and "instance" are beautiful examples of overworked medical jargon.

Worse than medical jargon is medical slang. The best type of medical writing is that which appears in the case report. The use of the word "gut" for intestine or the plural of the word for the other contents of the abdominal cavity may be considered a medical affectation quite as bad as "the acute abdomen." When the surgeon says he did a "chronic appendix," when the gynecologist speaks of "an abdominal woman," when the dermatologist "puts the patient on iodides" or when the internist says the patient "runs a swinging temperature," they are speaking medical slang. The gynecologist would hesitate to speak of doing a Caesar when he performs a cesarean operation. These are some of the specific examples cited by Hurter, and there are many more in "The Art and Practice of Medical Writing."

In the field of medical science, many men have gained note by their ability to express themselves in good English succinctly, rhythmically and accurately. The opportunity is available, for every one who cares to take the trouble and the time, to perform competently in the field of medical letters. Experts assert that there are hardly a hundred competent medical writers in our country today; some authorities insist that there are hardly more than ten or twelve. In the field of preparation for sound literary expression, particularly, preliminary education to medical training seems to be failing miserably.

2. Bureau of Agricultural Economics, U. S. Dept. of Agriculture, Release of May 24, 1934.

1. Hurter, H. R.: Language, Jargon, and Modern Medicine, Liverpool Medico-Chirurgical Journal **42**: 1 (part 1) 1934.

Current Comment

THE INCIDENCE OF POLIOMYELITIS

Poliomyelitis in California seems to be dwindling definitely, according to the most recent statement from the United States Public Health Service. The number of cases in Los Angeles declined from a maximum of 156 for the week ended June 9 to 28 cases for the week ended August 18. In Los Angeles County the number of cases declined from 100 for the week ended June 16 to 31 for the week ended August 11. In San Francisco the maximum was 27 cases for the week ended June 23, with 7 for the week ended August 11. For the whole state of California, 466 cases were reported for the four weeks period ended August 11 and the total was 2,446 cases for the fifteen weeks from the beginning of the epidemic during the last of April to August 11. Of the total cases, 1,752 (or 70 per cent) occurred in the city and county of Los Angeles. In the meantime the incidence of poliomyelitis has increased in other states. During the thirteen weeks ended August 18 there were 218 cases in Washington, 73 in Montana, 61 in Idaho, 20 in Arizona and 23 in Oregon, as compared to from

1 to 7 cases in the same states over the same period a year ago. Research on poliomyelitis continues, with the probability of the development of efficient methods of prevention some time in the near future.

Association News

ANNUAL CONFERENCE OF STATE SECRETARIES

The Annual Conference of Secretaries of Constituent State Medical Associations will be held at the Palmer House, Chicago, September 21-22.

The program will be as follows:

FRIDAY, SEPTEMBER 21, 10 A. M.

Call to Order. J. H. J. Upham, chairman of the Board of Trustees of the American Medical Association.

Address. Walter L. Bierring, President of the American Medical Association.

The Medical Society of New Jersey Experiments in Furnishing Medical Services in the Community. LeRoy A. Wilkes, executive secretary of the Medical Society of New Jersey.

The Centralization and Departmentalization of State Medical Society Activities. Oliver J. Fay, chairman of the board of trustees of the Iowa State Medical Society.

The Work of the Committee on Mental Health. H. Douglas Singer, chairman of the Committee on Mental Health of the American Medical Association.

12:30 p. m. Recess.

12:45 p. m. Luncheon at Palmer House.

FRIDAY, SEPTEMBER 21, 2 P. M.

Address. James S. McLester, President-Elect of the American Medical Association.

Medical Emergency Relief. Holman Taylor, secretary of the State Medical Association of Texas; William C. Woodward, director of the Bureau of Legal Medicine and Legislation of the American Medical Association.

Some Problems of a State Medical Editor. W. Edwin Bird, editor of the *Delaware State Medical Journal*.

Address. R. L. Sensenich, member of the Committee on Legislative Activities of the American Medical Association.

SATURDAY, SEPTEMBER 22, 9:30 A. M.

The Educational Possibilities of Scientific Programs at State and County Meetings. Clyde L. Cummer, president of the Ohio State Medical Association.

Health Insurance in England and Medical Society Plans in the United States. R. G. Leland, director of the Bureau of Medical Economics of the American Medical Association.

MEDICAL BROADCASTS

Columbia Broadcasting System

The American Medical Association broadcasts on a Western network of the Columbia Broadcasting System each Thursday afternoon on the Educational Forum from 4:30 to 4:45, Central daylight saving time. The next three broadcasts will be as follows:

September 20. Infantile Paralysis, W. W. Bauer, M.D.
September 27. Swimming Pool Sanitation, J. F. Hammond, M.D.
October 4. Autumn Leaves, W. W. Bauer, M.D.

The Most Glorious Epoch.—The work of Pasteur, a French chemist, Lister, a British surgeon, and Koch, a German district physician, marked for mankind the beginning of the most glorious epoch in the history of the world. These convergent discoveries with many subsequent laboratory findings created and developed a scientific understanding of communicable diseases which led to an almost unbelievable evolution in the theory and practice of medicine.—McFarlane, Andrew: The Family Physician—Past, Present, Future, *New York State J. Med.* **34**:579 (July 1) 1934.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ALABAMA

Health Unit Resumes Operation.—Activities in the Coffee County health unit have been resumed, with the appointment of Dr. William A. Stanley, Union Springs, as health officer. The unit was discontinued, Jan. 1, 1933, on account of the lack of county funds.

CALIFORNIA

Dinner to Dr. Bierring.—Dr. Walter L. Bierring, Des Moines, Iowa, President, American Medical Association, was the guest of honor at a dinner at the Biltmore Hotel, September 4, sponsored by the Los Angeles County Medical Association. The woman's auxiliary to the society was also present.

Special Society Meeting.—Three visiting speakers presented the program before the San Francisco County Medical Society at a special meeting, August 30: Henry F. Vaughan, Dr.P.H., health commissioner of Detroit, on "The Family Physician and Preventive Medicine"; Dr. William W. Bauer, Chicago, director, Bureau of Health and Public Instruction, American Medical Association, "Health Education by County Medical Societies," and Dr. John E. Gordon, epidemiologist of the Detroit Department of Health, "Trends in the Control of Communicable Diseases."

Society News.—Members of the staff of Mount Zion Hospital presented the program before the San Francisco County Medical Society, August 14; speakers included Drs. Harold H. Rosenblum on "Rate of Blood Flow in Patients Receiving Dinitrophenol" and Felix L. Pearl, "Angiospastic Claudication."——Dr. James P. Leake, surgeon, U. S. Public Health Service, Washington, D. C., who is in California in connection with the epidemic of poliomyelitis, addressed the Hollywood Academy of Medicine, August 16.——The Alameda County Medical Association was addressed, August 20, by Drs. Mark L. Emerson, Frank H. Bowles and Archibald A. Alexander on "Use of Histamine as an Indicator of Cutaneous Circulation in Leg Amputations," and by Drs. Paul P. E. Michael and Vernon G. Alderson, who discussed amebiasis.

COLORADO

Cancer Meeting.—A special meeting of the Delta, Mesa and Montrose county medical societies in Delta, recently, was devoted to a symposium on cancer of the breast. Drs. John B. Hartwell, Colorado Springs, Carl W. Maynard, Pueblo, and George A. Unfug, Pueblo, represented the committee on cancer education of the Colorado State Medical Society. A banquet preceded the session.

Psychiatric Studies Expanded at University.—Under a grant of the Rockefeller Foundation to the Colorado Psychopathic Hospital, Dr. Edward G. Billings has been appointed director of the liaison work between the departments of medicine and psychiatry in the Colorado General Hospital and assistant professor of psychiatry at the University of Colorado School of Medicine. The grant was made to further educational and clinical activities and to effect a closer relationship between psychiatry and general medicine. A five year demonstration period is anticipated. Other new psychiatric appointments include Dr. Clarke H. Barnacle as resident psychiatrist at the psychopathic hospital, to succeed Dr. William M. Peake, who resigned to become assistant professor of psychiatry at the University of Cincinnati Medical School, effective September 1. Drs. Jack R. Ewalt, Henry W. Brosin and Philip H. Hearsema have been awarded fellowships in psychiatry at the hospital by the Commonwealth Fund, effective September 1.

GEORGIA

Personal.—Dr. Gabe W. Willis, Ocilla, was recently honored when several friends gathered on the courthouse lawn to present him with gifts for his new hospital, which is nearing completion. A musical program was a feature of the occasion. ——Dr. Theodore Toepel, Atlanta, has been awarded an honorary membership in the Fulton County Medical Society; members of the society who have reached the age of 65 and have had twenty-five years of consecutive membership are eligible for honorary memberships.——A surprise birthday party was

given in honor of Dr. Lewis Sage Hardin, Atlanta, August 1, at the Georgia Baptist Hospital.

Society News.—At a meeting of the Fourth District Medical Society at Warm Springs, August 1, speakers included Drs. W. Wilbur Blackman, Atlanta, on acute gout; Ellis G. Kirby, Bowdon, rabies; Thomas Neal Kitchens, Warm Springs, morphine poisoning, and Jefferson G. Smith, McDonough, zinc oxide cast for second and third degree burns.——The Tenth District Medical Society was addressed at Washington, August 8, among others, by Drs. John W. Brittingham, Augusta, cardiovascular syphilis; Robert C. McGahee, Augusta, congenital syphilis; William Perrin Nicolson Jr., Atlanta, breast lesions; James M. Hull, Augusta, medical care of cataracts, and William J. Cranston, Augusta, gastric neuroses.——Speakers before the Burke-Jenkins-Screven Counties Medical Society at Millen, August 2, were Drs. Henry G. Lee, Millen, on diseases of the endocardium, and Cleveland Thompson, Millen, arachnoidism.

ILLINOIS

Campaign Against Impure Milk.—State officials have launched a campaign against the sale of impure raw milk, which is now being dispensed at roadside stands and milk depots in Illinois, according to the Chicago *Tribune*. Efforts have been concentrated in suburbs outside of Chicago, it was stated, where, in many cases, the milk depots do not come under the jurisdiction of municipal health authorities. It was pointed out that about 80 per cent of the depots investigated do not measure up to the sanitation standards of the state dairy and food division.

Chicago

Personal.—Dr. Leo K. Campbell has been appointed assistant clinical professor of medicine at Rush Medical College. ——A stag party was held at the Army and Navy Club, September 5, in honor of Major Lorin A. Greene, medical officer, sixth corps area, who is being transferred to foreign service in the Philippines. A dinner was also given in his honor recently at the Glenview Country Club. At this occasion, Dr. Cleveland C. MacLane was notified of his promotion to colonel in the medical reserve.

INDIANA

Exhibits at State Fair.—Exhibits and demonstrations in the Good Health Building at the State Fair, September 1-7, were sponsored by the Indiana State Medical Association, the Indiana State Dental Association, the state hospital and tuberculosis associations and the Indianapolis College of Pharmacy.

Courses in Tuberculosis.—August 30 marked the opening of a series of short courses in tuberculosis for physicians by the Indiana Tuberculosis Association. The first was held at the Boehne Tuberculosis Hospital, Evansville, for two days. Others in the series comprise the following:

Indiana State Sanatorium, Rockville, October 2-3.
Irene Byron Sanatorium, Fort Wayne, October 17-18.
Lake County Tuberculosis Sanatorium, Crown Point, October 18-19.
Sunnyside Sanatorium, Oaklandon, October 22-23.
William Ross Sanatorium, Lafayette, dates to be announced later.

There is no fee for these courses. Further information may be had from the Indiana Tuberculosis Association, Room 1219, 130 East Washington Street, Indianapolis.

Outbreak of Encephalitis in Evansville.—At least seven deaths are known to have occurred from encephalitis in Evansville during the past week, according to the Chicago *Tribune*. Cases of encephalitis have been reported in Hartford City, Shelbyville, Petersburg and Muncie. Steps have been taken to prevent the further spread of the disease. An investigation is being made to determine whether the type of disease in the Indiana outbreak is the same as that of the St. Louis epidemic which occurred last year and which is fully discussed in the present and the preceding issues of THE JOURNAL. The state health department and the U. S. Public Health Service are cooperating in controlling the outbreak. Four fatalities were recorded for Providence, Ky., and nine persons were said to be ill.

IOWA

Dr. Leech Honored.—Dr. Louis J. Leech, West Branch, was honored, August 3, when hundreds of friends assembled to observe his eighty-eighth birthday and his recent election to commander of the Iowa department of the Grand Army of the Republic. A musical program featured the occasion. Dr. Leech was presented with an initialed traveling bag. He graduated from the State University of Iowa College of Medicine in 1881 and has been practicing in and about West Branch since that time.

KANSAS

Play Day.—September 21 will be observed in Wichita as "Doctors' Play Day" in accordance with a proclamation issued by the mayor, Schuyler Crawford.

Annual Registration Due October 1.—All physicians and surgeons holding licenses to practice in Kansas are required to renew their licenses annually and to pay an annual fee of $1, between July 1 and October 1, to the secretary of the board of medical registration and examination. The secretary must strike from the register of licensed physicians the names of all physicians who fail to pay their annual registration fees as required by law. Physicians whose names are so removed may be reinstated by paying the secretary $5 and submitting to him satisfactory proof of moral fitness.

KENTUCKY

State Medical Meeting at Harlan, October 1-4.—The Kentucky State Medical Association will hold its annual meeting in Harlan, October 1-4, with sessions in the Methodist Episcopal Church. The annual oration in medicine will be delivered by Dr. William J. Shelton, Mayfield, on "The Mutual Interest of Physicians and Patients." Dr. Kennon Dunham, Cincinnati, will address a public meeting on "Pulmonary Emphysema, A Sequela of Pulmonary Tuberculosis," and Dr. William D. Haggard, Nashville, the same session, on "The Management of Goiter and Results in One Thousand Operative Cases." Dr. Isaac A. Arnold, Louisville, will deliver the oration in surgery on "The Fracture Problem—Present and Future Status." Other physicians on the program include the following:

William Woodward Nicholson, Louisville, Lead Poisoning in Children.
William Edgar Fallis, Louisville, Appendicitis in Children.
James W. Bruce, Louisville, Treatment of Diarrhea in Infancy.
Ellis S. Allen, Louisville, Diagnosis and Treatment of Congenital Pyloric Stenosis.
Lucien Lyne Smith, Louisville, Feeding the Diabetic.
Frank M. Stites Jr., Louisville, Amebiasis.
John L. Edwards, Lancaster, Treatment of the Tuberculous in the Home.
Arthur Clayton McCarty, Louisville, Newer Aspects of Arthritis.
R. Alexander Bate, Louisville, Endocrine, Vitamin and Allergen Relativity.
Adolph O. Pfingst, Louisville, The Wearing of Glasses—As It Relates to Medicine.
Ernest B. Bradley, Lexington, Treatment of Tetanus.
Thomas J. Crice, Louisville, Drug Addicts.
Curran Pope, Louisville, Further Studies and Observations of Hyperthermia (Fever Treatment).
Charles G. McLean, Lexington, Trend of Modern Medicine.
William B. Atkinson, Campbellsville, The Business Side of Medicine.
Franklin Jelsma, Louisville, Spinal Cord Tumors, Symptomatology and Differential Diagnosis.
Louis Frank, Louisville, Cancer of the Uterus.
Francis M. Massie, Lexington, End Results of Plastic Surgery.
William O. Johnson, Louisville, Study of 100 Cases of Ectopic Pregnancy.
Rufus C. Alley, Lexington, Internal Hemorrhoids: Treatment by Nonsurgical Methods.
William J. Martin Jr., Louisville, Etiology and Surgical Treatment of Anal Fistula.
John M. English, Elizabethtown, A Plea for Better Obstetrics.
Charles G. Daugherty, Paris, Chorea in Pregnancy.
Harry M. Weeter, Louisville, Laboratory Tests for Pregnancy.
David Y. Keith, Louisville, Malignant Tumor of the Thorax and Upper Abdomen.

Sessions on Tuesday and Wednesday will be devoted to round tables by the following physicians: Philip F. Barbour, Louisville; Henry G. Reynolds, Paducah; Virgil E. Simpson, Louisville; John H. Blackburn, Bowling Green; Morris Flexner, Louisville; Edward Speidel, Louisville; William Barnett Owen, Louisville, and Lillian H. South, Louisville.

MICHIGAN

Dr. Warnshuis Honored.—The Ingham County Medical Society gave a farewell dinner in honor of Dr. Frederick C. Warnshuis in Lansing, August 14, following his resignation as secretary of the Michigan State Medical Society to become secretary and director of public relations of the California Medical Association. Speakers included Drs. Leo G. Christian, Russell L. Finch, J. Earl McIntyre, all of Lansing; James O'Meara, Jackson, and James B. Bradley, Eaton Rapids. Dr. Warnshuis was made an honorary member of the society and presented with a leather traveling bag.

MISSOURI

Health and Tuberculosis Meeting.—The Missouri Public Health Association and the Missouri Tuberculosis Association will hold their annual sessions jointly at the Jefferson Hotel, St. Louis, September 19-21. Speakers to be heard at the various sessions include Drs. Thurman B. Rice, Indianapolis, and Kendall Emerson, New York.

Kansas City Clinical Conference.—The twelfth annual fall clinical conference of the Kansas City Southwest Clinical Society will be held at the President Hotel, Kansas City, October 1-4. Guest speakers include the following:

Dr. Walter L. Bierring, Des Moines, Iowa, President, American Medical Association, Acute Diseases of the Blood Forming Organs; Medical Societies of the Future; Heart Disease in General Practice.
Dr. Hugh Cabot, Rochester, Minn., Newer Conceptions of Diagnosis and Treatment of Infections of the Urinary Tract; Standards of Modern Medicine; Management of the More Difficult Cases of Renal Calculus.
Dr. Joseph B. De Lee, Chicago, sound motion picture on "Forceps Operation."
Dr. Morris Fishbein, Chicago, Organization of American Medicine; The Doctor's Hobby; Trend of Medical Practice.
Dr. Lee F. Hill, Des Moines, Certain Phases in the Management of Infectious Diseases; Rum and Babies.
Dr. Samuel Iglauer, Cincinnati, Deep Infections in the Neck and Mediastinum; Has Organized Medicine Taken a Proper Attitude Toward the Social Aspects of Medicine?
Dr. Samuel A. Levine, Boston, Clinical Significance of a Systolic Murmur; Factors in Prognosis in Heart Disease; Thyroidectomy in the Treatment of Intractable Heart Disease; The Doctor's Heart.
Dr. Henry O. Mertz, Indianapolis, The Urologists' Contribution to the Differential Diagnosis of Abdominal Conditions; Urology in Children.
Dr. Philip Lewin, Chicago, Classification, Etiological Factors and Treatment of Arthritis.
Dr. George E. Pfahler, Philadelphia, Diagnosis and Treatment of Cancer of the Breast; Oral Cancer; Its Diagnosis and Treatment; Cancer—What Is It?—How Can We Prevent It?—What Shall We Do for It?
Dr. Fred W. Rankin, Lexington, Ky., Hyperparathyroidism; Modern Management of Cancer of the Large Bowel and Rectum; Selection of Peptic Ulcers for Surgical Treatment; The Surgeon of the Future.
Alphonse M. Schwitalla, S.J., Ph.D., St. Louis, How a Man Becomes a Physician; Controlling the Output of the Embryo Physician.
Dr. Harry W. Woodruff, Joliet, Ill., Eye Injuries and the General Practitioner.

In addition to these speakers, addresses will be given by twenty-three members at the general assembly and sectional meetings.

NEBRASKA

Annual Registration Due October 1.—All practitioners of medicine and surgery holding licenses to practice in Nebraska are required by law to register annually, on or before October 1, with the department of public welfare and to pay a fee of $1. A license expires if the licentiate fails to register. Within the thirty days next following its expiration, however, it may be revived and kept in force by the payment of the registration fee and a penalty of $1. If that is not done, an order of revocation is issued.

Society News.—Dr. David M. Berkman, Rochester, Minn., addressed the Madison-Six Counties Medical Society, Norfolk, July 17, on "Classification of Albuminurias for Clinical Use." ——A joint meeting of the Brown County (Kansas) and Richardson County medical societies in Falls City, recently, was addressed by Drs. William G. Emery, Hiawatha, Kan., on county health work, and Henry J. Deaver, Sabetha, Kan., complications of pneumonia.——Speakers before the Five County Medical Association in Homer, July 2, included Drs. Arthur E. Cook, Randolph, on influenza and Walter Benthack, Wayne, on abdominal diagnosis. —— The Madison County Medical Society was addressed at Norfolk, July 17, by Drs. David M. Berkman, Rochester, on medical economics, and Lucien Stark, Norfolk, on diagnosis and classification of kidney disease.

NEW JERSEY

Child Health Survey.—The results of a five month survey of child health in New Jersey have been made available. Carried on as a C W A project by the state department of health under the direction of the child hygiene bureau, its purpose was to determine to what extent certain health protective measures had been employed in various parts of the state, such as medical health examinations, dental health examinations, immunization against diphtheria and vaccination against smallpox. In addition, data were obtained in regard to the incidence of certain contagious diseases among children of preschool age. A total of 273,546 families were visited, from whom 59,311 completed questionnaires were obtained. It was found that 163,678 or 73 per cent of the total number of families visited had no children under six years of age, to whom the survey was confined. The report shows 354 communities in twenty-one counties were surveyed and that 24.6 per cent of these communities had 30 per cent of their children immunized against diphtheria; 18 per cent had 20 to 30 per cent; 31.4 had 10 to 20 per cent and 26 per cent had less than 10 per cent of their children immunized. Two counties, Essex and Union, had, respectively, 75 and 65 per cent of their communities with more than 30 per cent of their children immunized against diphtheria. Essex County, the largest urban county, stands first in all three child health protective measures, presenting 46.1 per cent immunized against diphtheria, 36.9 vaccinated against smallpox, and 82.2 who have had a physical examination. Warren County, rural, presents the poorest record in regard to diphtheria immunization, appearing twenty-first with but 6.5 per cent immunized. Hunterdon County, rural, presents the poorest record in smallpox vaccinations, showing 4.5, while Cumberland County was poorest in child health examinations, presenting but 20 per cent. Of 205,473 children under 6 years of age, records show that 27.4 per cent have been immunized against diphtheria, and 23 per cent vaccinated against smallpox.

NEW YORK

Personal.—Dr. James L. McCartney, director of the Classification Clinic at Elmira Reformatory since 1931, has resigned to enter private practice in Portland, Ore. Dr. McCartney organized the clinic at Elmira.

Cancer Exhibit at State Fair.—The prevention and treatment of cancer was the theme of the health exhibit at the state fair at Syracuse, recently. One feature of the exhibit portrayed the cases successfully treated at the State Institute for the Study of Malignant Diseases at Buffalo. Cooperating in the exhibit were the division of public health education of the state department of health, the institute and the American Society for the Control of Cancer.

Septic Sore Throat from Contaminated Milk.—An outbreak of twenty or more cases of septic sore throat occurred between July 22 and August 13, *Health News* reports. All persons known to have been ill had used raw milk from a supply furnished by one dealer. Investigation revealed that a milker of the dealer's farm had had an infected finger and had milked six cows each night and morning until August 5, when he was obliged to stop working because of pain and swelling in his hand.

New York City

Annual Etching Exhibit.—The Haden Etching Club will hold its third annual exhibition at the Leonard Clayton Galleries, October 1-13. The closing date for entering prints is September 20. Only members are entitled to exhibit. Information may be had from Dr. Benjamin F. Morrow, 162 West Fifty-Sixth Street. The Haden Etching Club is an organization of dentists and physicians.

Course in Psychoanalysis.—The New York Psychoanalytic Institute announces an introductory course in psychoanalysis for physicians, consisting of fourteen lectures on "Psychoanalysis in Medicine." Lecturers will be Drs. Clarence P. Oberndorf, George E. Daniels, Sydney N. Lorand and Philip R. Lehrman. The lectures will begin October 4 and continue on successive Thursdays, omitting November 29. Registration may be made with Dr. Monroe A. Meyer at the institute, 324 West Eighty-Sixth Street.

New York Graduate and Stuyvesant Hospitals Join Forces.—An affiliation between the New York Post-Graduate Medical School and Hospital of Columbia University and the Stuyvesant Square Hospital was made effective September 1. Under the agreement, the Stuyvesant Square Hospital will maintain its identity. Membership of the board of directors of the graduate hospital will be extended to include members of the present directorate of the Stuyvesant institution. The latter will retain the control of its capital funds, including any funds subsequently received by gift or bequest for maintenance or endowment of beds, while the graduate hospital will take over the management and maintenance of buildings and equipment and the general administration of the hospital, funds for which are provided from the income of the Stuyvesant Square Hospital. The properties of the two affiliated institutions are contiguous. Stuyvesant Hospital is said to be the oldest cancer hospital in America, while New York Post-Graduate is described as the first exclusively gradute school of medicine in the world, and the teaching facilities of its general hospital are available only for the graduate physician. Both institutions were founded in 1882.

OHIO

State Medical Meeting at Columbus, October 4-6.—The eighty-eighth annual meeting of the Ohio State Medical Association will be held at Neil House, Columbus, October 4-6. Out of town speakers will include Drs. Rollin T. Woodyatt, Chicago, on "Diabetes Mellitus"; Charles P. Emerson, Indianapolis, "Psychoneurotic Reactions"; Albert C. Furstenberg, Ann Arbor, "Ménière's Symptom Complex: Medical Treatment," and Mark J. Schoenberg, New York, "Recent Additions to the Clinical Study of Intra-Ocular Pres-

sure and Glaucoma." Dr. Russell L. Cecil, New York, will conduct a clinic on chronic arthritis. Ohio physicians participating in the program will include:

Mont R. Reid, Cincinnati, Recent Advances in the Treatment of Peripheral Vascular Diseases.
Albert F. Kuhl, Dayton, Ambulatory Treatment of Rheumatic Heart Disease.
Russell L. Haden, Cleveland, Hypochromic Anemia.
Louis Feid Jr., Cincinnati, Treatment of Benign Uterine Bleeding.
Frederick M. Douglass, Toledo, Management of Common Duct Stone and Obstruction.
William Kelley Hale, Wilmington, General Treatment of the Cancer Patient with Special Emphasis on Maintaining the Normal Blood Picture.
Charles T. Souther, Cincinnati, Technic for Intestinal Anastomosis.
John Hart Davis, Cleveland, Clinical Aspects of Alkalosis.
Stanley D. Giffen, Toledo, Clinical Relationship Between Color of Nasal Septum and Various Biochemical and Endocrine States in Children.
Andrews Rogers, Columbus, Influence of the Upright Position on Pregnancy and Parturition.
Alphonse R. Vonderahe, Cincinnati, Representation of Visceral Function in the Brain.
Louis A. Lurie, Cincinnati, Rôle of Glandular Therapy in the Treatment of Behavior Disorders of Children.
Paul M. Holmes, Toledo, Medicolegal Aspects of Silicosis.
Arthur G. Cranch, Cleveland, Hypertension with Relation to Capacity for Work.
Finley Van Orsdall, Columbus, Development of Preventive Medicine.

The annual dinner will be held Friday evening at the Neil House, with Gustavus W. Dyer, Ph.D., professor of economics, Vanderbilt University, Nashville, Tenn., as the principal speaker. The annual golf tournament will be held, October 3, at the Columbus Country Club, while the Ohio State-Indiana football game is scheduled for Saturday afternoon, October 6.

PENNSYLVANIA

Campaign Against Appendicitis.—The Chester County medical and tuberculosis societies are cooperating in a campaign to reduce appendicitis mortality and maternal morbidity. Seventeen meetings are planned for October and November.

Philadelphia

Personal.—Dr. Martha Tracy, dean, Woman's Medical College of Pennsylvania, was recently elected a fellow of the College of Physicians of Philadelphia, the second woman to be so honored. The first was Dr. Catharine MacFarlane, professor of gynecology at the college.——Dr. James M. Anders celebrated his eightieth birthday, July 22.

Tuberculosis Conference.—The development and progress of the tuberculosis movement in recent years and present-day activities to control the disease will be considered in a conference to be held at the Bellevue Stratford Hotel, Philadelphia, October 18, under the auspices of the Pennsylvania Tuberculosis Society and the Philadelphia Health Council and Tuberculosis Committee, in cooperation with nearby county tuberculosis organizations. Speakers at the conference will include Drs. Charles J. Hatfield, executive director of the Henry Phipps Institute and president of the Philadelphia Health Council, and Dr. Kendall Emerson, New York, managing director of the National Tuberculosis Association. One session especially for physicians will consider "The Child." Speakers will be Drs. William Charles White, Washington, D. C.; Paul B. Kreitz, Bethlehem, and Esmond R. Long.

VIRGINIA

State Medical Meeting at Alexandria.—For the first time in more than fifty years, the Medical Society of Virginia will meet in Alexandria, October 9-11. This will be the sixty-fifth annual session; headquarters will be at the George Mason Hotel. Included on the scientific program will be the following physicians:

Harry Walker, Richmond, Treatment of Obesity.
James Morrison Hutcheson, Richmond, Medicolegal Aspects of Apoplexy.
Frank A. Strickler, University, A Study of Convulsive Disorders at the University of Virginia Hospital since 1920.
Thomas Dewey Davis, Richmond, The Irritable Colon.
Regena C. Beck, Richmond, Drug Idiosyncrasy and Neutropenia.
Douglas G. Chapman, Richmond, Total Thyroidectomy for Chronic Heart Failure.
Henry B. Mulholland, University, Diagnosis of Rocky Mountain Spotted Fever of the Eastern Type.
James Corman Motley, Abingdon, Wandering Spleen with Erosion of Its Pedicle.
Robert DuVal Jones Jr., Norfolk, Leiomyoma of the Gastro-Intestinal Tract.
Charles R. Robins, Richmond, Cure of Direct Inguinal Hernia.
Claude C. Coleman and William G. Crutchfield, Richmond, Observations in the Treatment of Acute Head Injuries.
John M. Emmett, Clifton Forge, Fifteen Hundred Spinal Anesthesias with Special Reference to Indications, Complications and Mortality.
Guy W. Horsley, Richmond, Surgical Treatment of 183 Consecutive Thyroid Cases with No Mortality.
Charles S. White and James Lloyd Collins, Washington, D. C., Evipan Anesthesia.
John S. Weitzel, Richmond, Problems in Breast Feeding.
Harry J. Warthen, Richmond, Gas Bacillus Infections: Study of the Incidence, Treatment and Mortality.
Martillus H. Todd, Norfolk, Colles' Fracture.
Joseph H. Hiden, Pungoteague, Experience with an Efficient Method of Operation for Hemorrhoids, Adapted to General Practice in Rural Districts.
Beverley R. Tucker, Richmond, Neuropathology of Pellagra in Its Relation to the Cutaneous and Other Manifestations.
Joseph F. Geisinger, Richmond, The Cystic Kidney.
James G. Lyerly, Richmond, Brain Tumors in Children.
James P. Baker, Anemias Dependent upon Food Deficiences.
Harry Hudnall Ware Jr., Richmond, Extra-Uterine Complications of Pregnancy.
James Edwin Wood Jr., George D. Capaccio and William N. Weaver, University, Venous Pressure and Body Weight Determinations in Congestive Heart Failure.
Claude Moore, Washington, D. C., Pathologic Lesions Correctly Diagnosed by Roentgenologic Methods and Later Missed at Surgical Exploration.
William W. Falkener, Newport News, J. Shelton Horsley, Richmond, and Thomas D. Walker Jr., Newport News, Vomiting in the Newborn, with Special Reference to Congenital Occlusion of the Duodenum.
James B. Nicholls and Lemuel R. Broome, Catawba Sanatorium, Collapse Therapy in Pulmonary Tuberculosis.

There will be a symposium on medical economics with the following speakers: Dr. James C. Flippin, University, Dr. Walter B. Martin, Norfolk; Dr. Irl C. Riggin, Richmond, and Edgar Sydenstricker of the Milbank Memorial Fund, New York.

WASHINGTON

Society News.—The Pierce County Medical Society was addressed in Tacoma, August 28, by Henry F. Vaughan, Dr.P.H., and Dr. John E. Gordon, health commissioner and epidemiologist, respectively, of the Detroit Department of Health; their subjects were "The Family Physician and Preventive Medicine" and "Trends in Control of Communicable Diseases."

GENERAL

Roentgenologists' Meeting.—The American Roentgen Ray Society will hold its annual meeting at the William Penn Hotel, Pittsburgh, September 25-28, under the presidency of Dr. George W. Grier, Pittsburgh. Dr. Walter B. Cannon, Boston, will deliver the Caldwell Lecture, Tuesday evening, September 25. Symposiums will be presented on high voltage roentgen therapy and on encephalography. Among others on the program will be:

Dr. Albert E. Bothe, Philadelphia, Effect of X-Ray Therapy upon Mixed Tumors of the Kidney in Children.
Dr. Walter L. Mattick, Buffalo, Our Changing Conceptions Regarding the Skin Dose.
Dr. Stuart W. Harrington, Rochester, Minn., Diagnosis and Surgical Treatment of Intrathoracic Tumors.
Dr. Pedro Fariñas, Havana, Cuba, Serial Bronchography in the Diagnosis of Pulmonary Suppurative Processes.
Drs. George W. Holmes and Richard Schatzki, Boston, Demonstration of the Mucosa of the Gastro-Intestinal Tract.
Drs. Willis F. Manges and Louis H. Cleft, Philadelphia, Congenital Anomalies of the Alimentary Tract.
Dr. Chester H. Warfield, Chicago, Roentgen Diagnosis of Aneurysms of the Innominate Artery.
Drs. Edward C. Vogt and James M. Baty, Boston, Leukemic Bone Changes, with Differential Diagnosis.

Occupational Death Rates.—In a study made by the National Tuberculosis Association based on data furnished by the U. S. Bureau of the Census the highest death rate among working men 15 to 64 years of age was found among hostlers and stable hands, 36.22 deaths per thousand employed. Other high rates were: operatives in harness and saddle factories, 30.55; aviators, 28.73; sailors and deck hands, 17.28. Low rates were found for teachers, 4.42, and social and welfare workers, 2.75. The general rate for all "gainfully employed males" was 8.7 per thousand. Among professional men, physicians and surgeons showed a rate of 10.69; clergymen, 10.33; lawyers, judges and justices, 7.89; college presidents and professors, 2.69. Unskilled workers commit suicide in greater proportion to their numbers than professional men, and agricultural workers less than semi-skilled workers in other pursuits. Tuberculosis takes the greatest toll among the unskilled. Heart disease claims more than the average of professional men; unskilled workers also have a high rate, but the rate for agricultural workers is only half the average. Rates for numerous other occupations and detailed rates for different diseases are given in the final report.

CORRECTION

Conservative Treatment of Late Toxemias af Pregnancy.—On page 551 of the article on this subject by Dr. L. G. McNeile (THE JOURNAL, August 25) appears an error in dosage. The article reads: "Patients who are very restless should be given chloral hydrate, 20 Gm., and sodium bromide, 60 Gm., by rectum." This should read "20 grains of chloral hydrate and 60 grains of sodium bromide."

Foreign Letters

LONDON

(From Our Regular Correspondent)

Aug. 18, 1934.

Nonsurgical Drainage of the Biliary Passages

In a lecture at Guy's Hospital, Dr. A. F. Hurst described how in the medical school the method of nonsurgical drainage of the bile passages had been developed from American observations. In 1917 Meltzer found that magnesium sulphate introduced into the duodenum leads to contraction of the gallbladder and biliary ducts with relaxation of the sphincter of the common bile duct (Oddi's sphincter). Two years later this discovery was practically applied by Lyon of Philadelphia, who showed that a specimen of bile could be obtained for diagnostic purposes through a duodenal tube after injection of magnesium sulphate. He subsequently proposed the same method for "nonsurgical drainage" of the gallbladder and bile ducts, but Dr. J. F. Venables of Guy's Hospital found that it was unnecessary to use a duodenal tube, as an equally good flow of bile was obtained if the salt was taken in concentrated solution by mouth during fasting. As biliary stasis is one of the chief factors in the pathogenesis of cholecystitis, cholangeitis and gallstones, Dr. Hurst considers administration of magnesium sulphate every morning a valuable method of treating disorders of the bile passages. The dose should be the largest the patient can take without causing looseness of the bowels. Some patients can take only half a teaspoonful but others as much as a tablespoonful. Incidentally two members of the staff of Guy's Hospital, Mr. E. G. Slesinger and Mr. Frank Cook, when students in the physiologic department, carried out some observations with Dr. Hurst, which showed that the old idea that a saline aperient acts by draining water into the bowel is wrong, as the watery stool passed an hour after taking it contained none of the salt, about half of which was found in the formed stool passed next day. The remainder was excreted in the urine within eight hours of being taken. As the salt had not reached the colon by the time the watery stool was passed, the only possible explanation is that saline aperients are absorbed from the small intestine and act from the blood by stimulating the secretory activity of the colon, the distention of which results in evacuation.

Olive oil, according to Dr. Hurst, has exactly the same effect on the bile passages as magnesium sulphate when introduced into the duodenum. It has the further effect of reducing the hyperchlorhydria that is present in those cases of cholecystitis which simulate duodenal ulcer. A tablespoonful should be given three times a day before meals. Dr. Hurst recommends that magnesium sulphate and olive oil should be taken for several weeks after cholecystectomy, as they help the common bile duct and Oddi's sphincter to adapt themselves to the new anatomic conditions and thus prevent the indigestion and occasional attacks of biliary colic that otherwise may occur.

The Village Settlement for Tuberculous Patients

The important advance of recent years in the treatment of tuberculosis is the village settlement, where it has been shown that patients in a new and suitable environment can recover health, support themselves and live with their families without danger to the latter. This method was originated by Sir Pendrill Varrier-Jones, who founded the first village settlement at Papworth, near Cambridge. In an article contributed to the *Daily Telegraph* he points out that the sanatorium cannot cure any but early cases of tuberculosis. Yet two thirds of the beds are occupied by middle and advanced cases for whom cure is out of the question. Many of these unfortunates, patched up by a few months of sanatorium treatment, are sent back to the environments in which they contracted the disease, armed with perfectly sound advice which they cannot possibly follow. Either they find work that overstrains their damaged physique or they do not, in which case they suffer from anxiety and malnutrition. They relapse and die after infecting relatives and friends. The remedy found by Varrier-Jones is obvious. Give them the environment they need. Give them work graduated to their physical capacity, in light, airy workshops equipped with machines to do the heavy work they cannot do. Enable them to live in home conditions approximating as closely as possible those of a sanatorium. This has been done successfully at Papworth, with its hospitals, sanatoriums and village settlement. From small beginnings it has grown until today its medical buildings contain 415 patients, and a village population of some 500 persons is maintained by the work of its tuberculous bread winners, who are earning wages amounting to $100,000 a year, incurring little or no revenue loss in the process. Children have been born to tuberculous parents and have grown up free from disease. Tuberculous men and women have fashioned for themselves new careers in their new environment, with great advantages physical and financial to themselves and the public. Families thus voluntarily and agreeably segregated do not spread infection among the community. The capital cost of the scheme is balanced by its saving. It cuts the vicious circle of infection. It stops the cruelty implicit in tendering impracticable advice. It robs tuberculosis of its worst economic terrors.

An International Pharmacopeia

Presiding at the British Pharmaceutical Conference, Dr. C. H. Hampshire emphasized the need for an international pharmacopeia. For the same reasons that led this country to demand a British Pharmacopeia there had arisen from time to time a desire for the unification of the standards for drugs and of the strengths and formulas of preparations through the medium of an international pharmacopeia. The advantages of such uniformity on the continent of Europe were obvious. Differences in national standards for widely used materials were a hindrance to the spread of medical knowledge, an inconvenience to pharmacists in dispensing prescriptions brought from various countries, and a source of trouble and possibly of danger to travelers. The unification of assay methods, of manufacturing standards and of processes was an object worthy of enthusiasm. The formation of a permanent central organization to keep the various national commissions in touch with one another, to arrange for collaborative investigations and to collect and distribute reports on pharmacopeial revision was urgently necessary and would do much to bring about the desired result.

Medical Services for South African Natives

The medical needs of four million Bantus living in the native reserves of the South African Union furnish a problem of some urgency. Six years ago a commission was appointed to inquire into the practicability of training Bantus in medicine to serve their own people. It was pointed out that in some areas there was only one physician for 40,000 people and that native herbalists and witch doctors flourished. The committee recommended a full course of medical training for natives at one of the South African universities, but the government considered this impracticable. It is now arranging a special training of suitable natives in a shortened course not leading to medical qualification. Those so trained will be called "native medical aids." The training will differ fundamentally from the medical curriculum in that it will not be concerned with principles. The "medical aid" will be trained to do a limited number of duties well—first aid treatment and the preparation of blood smears for malaria examination, of nasal smears for leprosy examination, and of sputum for tuberculosis examination. He is to be made capable of treating most of the ordinary ailments

and injuries and of knowing when to call in a physician. He will be in full time government employ, and private practice will be precluded. He will be given a house considerably superior to the huts of the kraal where he will be stationed and will have a dispensary and consulting room. It is contemplated that 200 native medical aids will be provided at a cost to the state of $350,000 per annum.

The Education of Partially Sighted Children

The board of education has issued a report on the education of partially sighted children. Schools for them are of much more recent origin than schools for the blind. They began in 1908 with the formation of a "myope class" in London, and the policy of schools for the partially sighted has since rapidly spread all over the world. Myopia is by far the most important condition for admission to these schools. It is generally held that faulty posture in reading and writing, poor illumination and excessive convergence of the eyes, such as may occur in reading small print or doing fine needlework, increase myopia and are only too common in ordinary schools. Evidence was given by ophthalmic surgeons that rapid progress of myopia may be arrested if close work is stopped and attention given to the general health. By reducing the factors causing undue stress on the eyes, some decrease or arrest of the progress of the myopia can be produced, but the result is not always permanent. Some evidence was given that the educational restrictions due to attendance at a special school were not always justified by the results. The committee arrived at the following conclusions: 1. If the eyes show fundus changes indicative of serious myopia, the child should always be admitted to a special school. 2. In the absence of such changes the child should usually be admitted if (*a*) after repeated examinations the myopia is found to be increasing at the rate of more than 1 diopter per annum; (*b*) after a period of slow rate of increase or apparent arrest there is a sudden rise in the rate of progress to more than 2 diopters per annum. 3. The actual amount of myopia should not be the sole factor in determining whether or not a child should be sent to a special school. 4. The age of the child must be taken into account. The younger, the more serious are factors such as the degree of myopia and its rate of progress. In doubtful cases the history of myopia in the family may be a deciding factor. 5. Myopic children with a visual acuity after correction of 6/24 or less should be admitted to a special school. Children suffering from damaged eyes due to the disease should not be admitted to these schools so long as there is any inflammation.

THE EDUCATIONAL PROGRAM

Great difference of opinion was manifested with regard to this. One view was that the danger to the sight of myopic children from reading was so great that they should be discouraged from it as much as possible. Another school would allow books under carefully guarded conditions, holding that the risk was not so great as to justify the loss of educational advantages. The committee took a middle course. It recommended that under the age of 8 books should be sparingly used and the main work done on blackboards, which should be supplemented with books printed in 24 point type as far as is advisable. For older children 18 point type need not be prohibited entirely.

EMPLOYMENT

The partially sighted are more likely to become unemployed than are those without this disability. But with good personal qualities they can sometimes work their way into permanent posts of value. The committee is averse to specific vocational training, such as is given to the blind. The object should be to educate these children, as far as possible, to compete on equal terms with others.

Legislation Against Sex Offenses in the Irish Free State

A bill has been passed in the dail of the Irish Free State making the penalties for sexual offenses more severe. As the law stood, it was a felony to have intercourse with a girl under the age of 13 years and a misdemeanor to attempt it. The present bill raises the age to 15 years. By previous acts it was a misdemeanor to have or attempt intercourse with a girl above the age of 13 years but under the age of 16 years. The bill raises these ages to 15 and 17 years respectively. Another section of the bill makes it an offense for a prostitute to loiter in any street or thoroughfare for the purpose of solicitation. For the first offense the penalty is a fine not exceeding $8; for the second, imprisonment for a term not exceeding six months. It is also made unlawful to sell or expose for sale, advertise or import any contraceptive. The penalty is a fine not exceeding $250 or imprisonment for a period not exceeding six months or both. In the debate it was pointed out that while the majority of the Irish people condemned the use of contraceptives as immoral, there were many who did not share this view. A virtuous married woman was often faced with the advice that pregnancy might endanger her life or injure her health. She had no other alternative but abstention from intercourse or contraceptive precautions. Abstention might be almost impossible or lead to grave nervous disturbance and unhappiness in both husband and wife. It was argued that to deny an alternative to those whose consciences allowed them to adopt it was unjust. Nevertheless, this clause of the bill was passed.

PARIS

(From Our Regular Correspondent)

July 25, 1934.

Phonendoscopy and the Diagnosis of Perivisceritis

Articles have appeared recently in regard to certain signs that may aid in the diagnosis of subhepatic perivisceritis. Lardennois called attention to the significance of pain in the right hypochondrium elicited on raising the arms. Lyon discovers subhepatic adhesions with the aid of a tuning fork. A stethoscope is placed on the inner side of the left costal border, and the base of the tuning fork is shifted from the median line toward the axillary line and along the right costal border. Normally the sound thus elicited is weak and far different from the gastric sound, which is clear and intense when the tuning fork is placed over the stomach in the left portion of the epigastrium. The gastric sound, on the contrary, is heard when the tuning fork is over the ninth or tenth rib if there are peripyloric and perivesicular adhesions; if the adhesions are dense and extend to the ascending colon and the cecum, the gastric sound is heard even when the tuning fork is placed on the axillary line. Ferrabouc and Jude, on studying the transmission of sound produced by a tuning folk the base of which rests on the abdominal wall, observed that, in perivisceritis of the right side, the sound is transmitted better between the epigastrium and the right iliac fossa than between the epigastrium and the left iliac fossa. They explained the following technic before the Société médicale des hôpitaux: The stethoscope being on the epigastrium halfway between the umbilicus and the xyphoid appendix, the vibrating tuning fork is carried several times back and forth from McBurney's point to the symmetrical of this point with relation to the median line of the abdomen. If there is perivisceritis of the right side, the sound is heard on the right, sometimes more loudly and sometimes longer than on the left side. The authors noted in ten cases the pain on raising the arms, and the bilateral sign of the tuning fork was positive in thirty-nine cases; but they point out that research by the last mentioned means is delicate. The physical signs have a secondary value, the advantage

remaining with the functional signs, which are strongly supported by radiologic examination. Of the physical signs, the most reliable and the most objective are those that utilize the transmission of sound vibrations through the abdominal viscera.

The Dictaphone and Competitive Examinations for Internships

The annual competitive examination to decide which medical students previously appointed, likewise on the basis of a competitive examination, to externships in the hospitals shall become interns, has never ceased, since its institution more than a hundred years ago, to provoke criticism. Those who fail to receive appointments are prone to charge the system with injustices. The committee of award is composed of hospital physicians and surgeons, who are chosen by lot. The members of the committee are frequently accused of favoring externs who have studied under them, with a view to recruiting a scientific entourage and strengthening their own particular "school." New means are therefore constantly being sought to prevent the judges from knowing the names of the candidates whose papers they examine. For the written portion of the examination the papers of the candidates are anonymous, being merely supplied with a number affixed by the administration, the owner of which remains unknown until after the papers are corrected. But for the oral portion of the examination the same method could not be applied. Mr. Mourier, director of the competitive examination, has discovered an ingenious solution. Each candidate will give to the dictaphone his replies to the oral questions, and from the wax records thus made disks will be prepared, which will reproduce, with the aid of a talking machine, the replies of the candidates in the presence of the judges. In this manner the identity of the candidates will be safeguarded. The cost of applying this method will be about 25,000 francs ($1,500) for each examination.

Pericarotid Sympathectomy

Pericarotid sympathectomy, which was performed a few years ago by Mr. Leriche of Strasbourg, was regarded at first as a physiologic curiosity of experimental surgery. It produces a profound modification of the vascular action in the field of the sympathetic and in the area irrigated by the carotid artery. Mr. Magitot, in a communication to the Academy, has pointed out what good results can be secured with this operation in retinal disorders of spasmodic vasomotor origin and even in the progressive atrophies of the optic nerve. He reported six typical observations of persons who were gradually going blind, in whom this operation frankly checked the process and brought about a marked retrogression of the lesions thus far developed. The operation may be indicated also in other spasmodic vasomotor disorders affecting brain circulation. The operation is fairly simple, consisting in the decortication, for about 2 cm., of the nerve sheath of the common carotid, the decortication being continued up to the bulb of the internal carotid. In order to make the destruction of the nerve plexus more certain, the intervention ends with an application of isophenol.

The American Hospital (Neuilly)

Mr. Jesse I. Strauss, ambassador of the United States to France, paid an official visit to the American Hospital (Neuilly) to preside over the distribution of nurses' diplomas secured by the sixteen pupils who had completed the courses. Mr. Arthur T. Kemp, chairman of the administrative council of the school, explained to the ambassador that the diploma thus bestowed is highly appreciated, and that nurses who hold such a diploma easily find employment not only in the American Hospital but also in foreign countries. Dr. Georges M. Converse, head of the medical services, expressed regret that the school was obliged to close for lack of financial support, which has been the fate of many other American undertakings in France since the devaluation of the dollar has reduced by 40 per cent the value of the funds supplied from the United States. The departments of the American embassy in Paris have been able to retain their personnel only because they succeeded in bringing it about that, since June 1, their salaries and expense accounts have been paid in French money on the old basis.

Street Named in Honor of Dr. Carlos Finlay

The municipal council of Paris recently gave the name of Dr. Carlos Finlay to a street of the fifteenth ward of the capital, an honor to a foreign scientist almost without precedent, Humboldt and Linné being further examples. Finlay, whose mother was French, studied in France, and on returning to his native country he announced the theory of transmission of yellow fever by mosquitoes. Last December the Academy of Medicine had celebrated the centenary of Finlay's birth at a special session attended by Professor Dominguez, who came to France to pronounce the eulogy of his compatriot.

BERLIN

(From Our Regular Correspondent)

July 23, 1934.

Special Eugenics Courts

New legislation has provided special courts to determine what cases shall come within the application of the sterilization law. The reports of some of these courts are now available. The first session of a special eugenics court was held in Berlin on March 15. Up to May 30, twenty sessions had been held; in the meantime, a second chamber of the court has been organized. Within the period just mentioned, 348 court decisions were rendered, and in 325 cases sterilization of the person was ordered, while in the remaining twenty-three cases the request for sterilization was denied. In the 325 cases, the request came from the patients in 143 instances, seven times from the guardian, thirty-one times from the health officer, six times from the "court physician," and 138 times from directors of institutions. Table 1 shows the relative frequency of sterilization in males and females of various age groups.

TABLE 1.—*Relative Frequency of Sterilization in Males and Females*

Age Groups	Males	Females
Under 20 years	5	8
20-29 years	80	66
30-39 years	69	50
40-49 years	27	9
Above 50 years	11	0
	192	133

Table 2 shows the condition that was the basis for sterilization.

TABLE 2.—*Basis for Sterilization*

Hereditary Disorder	Number of Cases		Percentage of the Total
	Males	Females	
Congenital feeblemindedness	52	44	29.6
Schizophrenia	59	53	34.4
Circular insanity	6	3	2.8
Hereditary epilepsy	51	29	24.6
Hereditary chorea (Huntington)	1	0	0.3
Hereditary blindness	0	0	0
Hereditary deafness	1	1	0.6
Grave hereditary bodily deformity	0	3	0.9
Alcoholism	22	0	6.8
Totals	192	133	100.0

It appears that congenital feeblemindedness and schizophrenia comprised about one third of the cases.

The eugenics court in Kiel ordered 102 sterilizations during the months of March and April. An analysis of the fifty-five

sterilizations ordered in March, with respect to the basis justifying such intervention, is shown in table 3.

TABLE 3.—*Analysis of Fifty-Five Sterilizations Ordered at Kiel in March 1934*

Hereditary Disorder	Males	Females
Congenital feeblemindedness	9	21
Schizophrenia	6	5
Epilepsy	4	6
Alcoholism	4	0

The Hamburg eugenics courts have received 1,325 applications for sterilization, a decision having been reached in 761 cases. Sterilization was refused in only seven cases. About 60 per cent of the cases concerned women.

Eugenics in Relation to Deafness

The sterilization law necessitates a consideration of hereditary deafness, which is one of the notifiable hereditary disorders. For a long time it had been conjectured that deafmutism is hereditary. Hammerschlag has demonstrated that the movement of the Japanese dancing mouse, which is analogous to deafmutism, is transmitted, in accordance with the mendelian law, in the form of a monohybrid, recessive hereditary process. He concluded that the hereditary process of deafmutism in man might be the same. The hereditary disorders of the inner ear can be grouped together under the heading "heredopathia acustica." Hammerschlag differentiates (1) hereditodegenerative deafness (identical with constitutional sporadic deafmutism), (2) progressive labyrinthine hardness of hearing, (3) premature occupational hardness of hearing, and (4) otosclerosis. According to Hammerschlag, these disorders form a single unit from the standpoint of hereditary biology, which contention is denied by others; for example, Albrecht, who demonstrated that these various disorders present a diverse mode of hereditary transmission. Constitutional, sporadic deafmutism is transmitted in a monohybrid recessive manner, hereditary labyrinthine hardness of hearing being dominant. Concerning the hereditary type of otosclerosis nothing definite is known. Of these disorders, the law is concerned only with group 1, for the three other groups seldom lead to deafness, and even in the presence of high-grade hardness of hearing patients can be helped by prostheses, particularly in otosclerosis. In spite of its dominant hereditary process, hereditary hardness of hearing due to conditions existing in the inner ear seldom results in deafness in the offspring. There is difficulty in recognizing these cases. The classification into "congenital" or "acquired" cases is not fortunate, since likewise congenital deafmutism may be acquired in utero; for example, through syphilis, meningo-encephalitis or birth trauma. A better distinction would be "inherited" and "acquired" deafmutism. To the former would belong constitutional-sporadic and endemic deafmutism, usually associated with cretinism and idiocy; to the latter would belong the intra-uterine and the postfetal types, resulting from ear suppurations or infectious diseases. The diagnosis is easy if other hereditary stigmas are demonstrable; for example, retinitis pigmentosa, feeblemindedness or cretinoid habitus. In the other cases the diagnosis can be made plausible only on the basis of researches on the family tree. Likewise the intact condition of the vestibular apparatus points to inherited deafness; for the vestibular apparatus, as the phylogenically older organ, does not suffer so easily hereditary injuries as the younger cochlear apparatus. The question as to whether all deafmutes, on proof furnished that their condition is of a hereditary nature, should be sterilized will be negatived; yet it appears justifiable to incorporate hereditary deafness in the law. A conservative estimate places the number of hereditary deafmutes in Germany at about 13,000. This figure would indicate that some 1,500,000 persons are the bearers of the hereditary predisposition. New patients will be found among the offspring if two persons with such a predisposition become mated. A careful choice of persons to be subjected to sterilization must be made. Obviously deafmutes with other hereditary disturbances of the central nervous system (idiocy, feeblemindedness, and the like) will be considered first under the law. Importance attaches also to the sterilization of other deafmutes of hereditary origin who wish to enter on the marriage relation. That would be a big accomplishment, since 72 per cent of the deafmutes select life partners from their own group. In all other cases great caution must be exercised in making decisions. There are many highly intelligent deafmutes of hereditary origin who are far above the average of human stock.

Meeting of the Society of Pathologists

The Deutsche Pathologische Gesellschaft convened in Rostock in May under the chairmanship of Hueck of Leipzig, who discussed the formation of metastases. Gliomas may occasionally develop metastases of the meninges but they do not occur outside the meninges, probably because they cannot break through the vessel walls. Henschen distinguishes glioblastomas, astroblastomas, astrocytomas, oligodendrocytomas, glioepitheliomas, choroido-epitheliomas, pinealomas, neuroblastomas and, as a special group, heteromorphous glioblastomas. The gliomas probably develop on a dysontogenic basis. While a traumatic origin may not be impossible, such a conclusion should not be reached without most careful consideration of all the facts.

Schmincke of Heidelberg, among others, pointed out that diffuse meningeal glioma formation is probably due to defects of development. Differentiation from meningeal sarcomas is difficult. These cases may easily be overlooked at operation. W. Müller of Berlin brought out that, during the period between operation and death, not infrequently a marked loss of differential features in the histologic structures of gliomas takes place. Pette of Hamburg emphasized that, from the neurologic standpoint, the clinician is interested, above all, in the question of malignity and cerebral tumefaction in association with gliomas. He is satisfied to divide gliomas into a benign and a malignant group. Malignant gliomas begin with a modification of personality without other demonstrable disturbances of functioning, whereas the onset of the benign type is marked by paralysis.

No further comprehensive papers were presented, but there were numerous other communications on certain details of the subjects. Henke of Breslau cautioned against considering all giant-cell sarcomas as epulis or osteitis fibrosa, for there are giant-cell tumors that occur in the tendon sheaths and the bones and that may be regarded as true sarcomas. Primary carcinoma of the pharyngeal tonsil is less rare than has been supposed; Graeff of Hamburg observed three cancers of the epipharynx among eleven pharyngeal cancers.

By research on the effects of exhaust gases of autos, Schmidtmann of Cannstadt found that rabbits develop at first leukocystosis, which is followed by leukopenia and, if no relief is afforded, by death. Histologically the spleen shows the most marked changes. Similar changes were observable in workmen from the various industrial plants.

Research by Aschoff of Freiburg on the carotene content of human tissue demonstrated that cholesterol from atherosclerotic foci contains ten times as much carotene as ordinary fat, while the cholesterol of the suprarenals contains twenty times as much. In the liver, the carotene is changed to vitamin A, as can be demonstrated from the third fetal month on. In chronic nephritis, however, this transformation is disturbed. While the vitamin A disappears, the carotene content increases greatly. In cirrhosis of the liver, both values decline.

According to the research of Sjoevall-Lund, the changes in the central nervous system in amaurotic idiocy do not have to

do with a secondary storage of lipoids but with an independent hereditary disturbance of the metabolism of these cells. As an expression of the premature aging of these brains, one may observe an extensive fibrogliosis.

Siegmund of Stuttgart was unable experimentally to produce pneumonoconiosis in animals by means of inhalation. On the intravenous injection of pure quartz, fibrosis developed only in the liver and not in the lungs. Evidently, fibrosis is produced only by quartz in a colloidal form. Similar conclusions were reached by Giese of Freiburg, who found tubercle-like changes, such as cirrhosis of the liver and fibrosis of the spleen. His experiments led to no involvement of the lungs.

NETHERLANDS

(From Our Regular Correspondent)

Aug. 3, 1934.

Malaria in the Deltas of the Rhine and the Meuse

Malaria persists in the foci of North Holland, Friesland and the island of Walcheren. The foci that one encounters in South Holland, at the mouth of the Meuse and the Rhine, and also to the east of Groningen, at the mouth of the Ems, are even more important. The pathogenic agent is a particularly benign strain of Plasmodium vivax. The incubation period in dementia paralytica patients subjected to inoculation with this strain is three weeks (Korteweg). Attention is called to the long duration of the latent state of malaria, persons infected in September, October or December presenting ordinarily their first attack in April, July and August of the following year, after an interval of from seven to nine months. The majority of cases occurring in the Netherlands during the ordinary summer epidemic of malaria are due to infections contracted during the preceding autumn or winter. From April to the end of August, one finds practically no infected Anopheles. The secondary autumnal recrudescence of the frequency of malaria is doubtless due to exceptionally massive infections in which the ordinary period of latency is suppressed. Thus it can be understood why a high autumnal frequency of malaria may be the forerunner of an epidemic for the following year.

The deltas of the Rhine and the Meuse are not foci of malaria primarily because of the natural delta formation but because man has influenced their formation by the process of retrieving land, termed "poldering," the result of which is the transformation of harmless but useless salt-water lakes into rich soil areas traversed by ditches, which contain brackish waters, thus facilitating the propagation of atroparvus; but this system of polders, or dikes, which has engendered malaria in North Holland, has brought about its disappearance in South Holland, by substituting fresh water for the previous brackish waters, and thus replacing atroparvus with messeae. The hope appears reasonable, therefore, that, following the completion of the huge undertaking that has been launched in the Zuider Zee, and the transformation of the region that is not retrieved into a fresh-water lake, one will witness the disappearance of atroparvus, and consequently of malaria, and the predominance of the messeae variety. This system of retrieving land is, in principle, an antilarval campaign directed against atroparvus. If the undertaking succeeds, the province of North Holland, the chief focus of malaria, will be the first to get rid of its brackish waters and of its fauna of atroparvus. Friesland, which has the second highest frequency of malaria, will also derive great advantages from the great hydrographic revolution that the new system will inaugurate. The foci of malaria in the provinces of Groningen and Zeeland will alone remain uninfluenced by the retrieving of lands in the Zuider Zee. But, in view of the unimportant rôle of these provinces in the malaria problem of the Netherlands, it is reasonable to hope that most of these foci will disappear, thanks to the measures designed to eliminate not all the Anopheles but solely the fraction that, at the present time, is the cause of malaria. From this point of view, the immense project of retrieving the land occupied by the Zuider Zee may be regarded as a crusade against the carrier species of Anopheles.

Inoculation of Tick-Bite Fever into Dementia Paralytica Patients

In the *Nederlandsch Tijdschrift voor Geneeskunde*, Pijper and Hélène Dau give an account of their experiments carried on in Pretoria in treating dementia paralytica patients by inoculation with tick-bite fever. Tick-bite fever is a mild disease of the exanthematic typhus group, with a primary necrotic lesion. The virus may be preserved by passages through the guinea-pig, and such virus was used to inoculate patients having dementia paralytica. While the inoculation produced no therapeutic effect, the patients thus treated developed specific agglutinins, and in one case the virus was transferred from the patient to the guinea-pig without undergoing any apparent modification.

The mildness of the attacks confirms the fact that the virus of tick-bite fever and that of exanthematic typhus are not identical. The experiments brought out also that not all persons are susceptible to tick-bite fever. In persons who are not susceptible, the virus may circulate for two weeks.

Drinking Water

The Royal Bureau of the Netherlands publishes in the *Verslagen en Mededeel. betr. de Volksgezondheid* a report on its recent activities in improving the drinking water of the whole country. The report gives a survey of the undertakings throughout the country, illustrated by maps and tables. It appears that the communes having their own system of water supply, which on Jan, 1, 1928, numbered about 400 out of 1,081, served a population of 4,600,000 out of a total of 7,500,000. By Jan. 1, 1933, this number had increased to 625 communes (out of 1,076), serving a population of 6,500,000 out of a total of 8,200,000. North Holland and South Holland are the provinces that have the largest percentage of water systems, serving respectively 99.6 and 99.16 per cent of the total population. The provinces of Gelderland and Drenthe have the lowest percentage, 52 and 26.6 per cent, respectively. In some provinces a single company has a monopoly not only in a given city but also for the surrounding rural districts. The province of Drenthe is planning to combine its water system with that of Overijssel. Sometimes, for geographic reasons or otherwise, the organization is less centralized, but there is always a tendency to combine smaller systems into one large system. This tendency has its good and its bad features. Many difficulties result from the development of both national and foreign industries, which influence more and more the quality of the water in the rivers, from the greater utilization of dune areas, and from the increase in the amount of water consumed per person.

Weil's Disease in the Dutch East Indies

The *Geneeskundige Tijdschrift voor Nederlandsch Indie* for Sept. 12, 1933, contains a communication of Dr. Mochtar on the frequency of Weil's disease in Celebes. The disease is rarely observed in Java, and in Batavia only three cases have been seen since 1925. No cases had been reported from Samarang up to 1932. The first case was observed in May 1932, since which time thirty-nine cases have been notified. Infection with Spironema icterohaemorrhagiae was suspected, and examination yielded nine cases with positive results. Of these nine cases, eight were reported from Samarang and one from Magelang. Two of these cases were fatal. In one of the two fatal cases, amebic dysentery was a complication. The clinical signs were the ordinary symptoms of Weil's disease. The mode of transmission of the disease to Samarang is

unknown. The large percentage of sewer rats that are carriers of the causative organism is an important factor not to be overlooked and leads to the belief that these rats play a part in the transmission of the disease.

Bezemer states that five cases of Weil's disease were observed between May 20 and June 1, two cases ending fatally. The mode of infection is not clear.

CAPE TOWN

(From Our Regular Correspondent)

July 31, 1934.

Payment of Hospital Staffs

During the last six months the profession has seriously considered and reconsidered its attitude toward the problem of the payment of hospital staffs. At the last meeting of the federal council of the association it was decided to leave to individual branches the decision whether or not to demand payment for services rendered to pauper patients in state supported hospitals. Briefly stated, the position in the Union of South Africa is as follows: There are no hospitals supported wholly by voluntary contributions; all hospitals are a charge on the taxpayer and to a lesser extent on the ratepayer, since the municipalities must make good the deficit under certain conditions. The expense of upkeep therefore falls on the doctor just as much as on any other class of taxpayer. But the provinces demand from the doctor free service for pauper patients and in addition mulcts him in a yearly "license to practice" fee of £10. Under these circumstances the profession has decided that it will give voluntary service only where other classes of the community also give some voluntary service: in teaching hospitals attached to the universities. But no uniform plan to enforce this decision has yet been formulated, and in view of the divergence of local conditions and the difference of local views it may be quite impossible to agree on a uniform plan. In one province, Natal, most of the hospitals are already paying their honorary staffs; in a few hospitals in the Transvaal and the Free State the request for payment has been agreed to; in one hospital in the Cape Province payment is made. But the public does not yet understand why this request should be made, and much misunderstanding would be avoided if the profession would frankly disclose to the public what it today gives to the government in the shape of free service, time and experience. There is no reason whatever why the government should adhere to its licensing tax; the income derived from that source is a mere trickle toward the provincial treasury, and the abolition of the tax, which the doctors regard as iniquitous, would to some extent meet the requirements of the profession for the recognition of the general principle that where the pauper is a charge on the taxpayer it is unfair to saddle one class of taxpayer with a disproportionate sum for his support.

The New Workmen's Compensation Act and the Medical Association

A measure of considerable interest to the profession was rushed through the last session of parliament and has attracted far less attention than its inherent importance deserves. This is the workmen's compensation act, an act which, thanks to the prompt action of the parliamentary committee of the medical association, is the first piece of legislation that makes definite provision for the treatment of private persons by the medical profession when such persons are injured in the course of their employment. The association, indeed, is actually referred to by name in the act itself in a remarkable clause which states that "the fees and charges for medical aid to workmen shall be in accordance with the scale prescribed by the minister from time to time after consultation with the Medical Association of South Africa, and no claim for an amount in excess of a fee or charge in accordance with that scale shall lie against any workman or his employer in respect of any such medical aid." This is an advance in the right direction, and the profession is to be congratulated on it. The new act will complicate some matters, and it is unfortunate that the request of the committee of medical men to which the association referred it, that better provision might be made for accident cases admitted to hospitals, was not complied with. In labor circles there was, unfortunately, a certain amount of opposition to the bill, caused partly by suspicion of the present government, which has not shown itself particularly friendly toward labor, and partly owing to a misunderstanding of the benefits under the act. Under the circumstances the profession must be satisfied with the benefits it has managed to secure.

Tick Bite Fever

There has for a long time been differences of opinion among pathologists in regard to several febrile diseases that belong, apparently, to the Rickettsia group of typhus-like fevers. Pijper of Pretoria has now demonstrated that one of these febrile disturbances is a definite clinical entity, to which he has given the name tick bite fever. In recent papers Pijper has dealt with the clinical and serologic aspects of the disease. Tick bite fever is characterized by a primary lesion with a necrotic black center, the result of the infected tick bite, with secondary swelling of the infected lymph glands. The incubation period is eight days; it has an exanthem in the form of macules or maculopapules and is accompanied by severe headache and by a rise of temperature lasting ten days. The diagnosis is easy, when one suspects it, and the prognosis is favorable; no fatal case has as yet been recorded. The Weil-Felix reaction is positive only in convalescence, and the disease gives perfect specific immunity. The treatment is symptomatic. In the Transkei, where the disease is common, old practitioners pin their faith to large doses of sodium salicylate, which have an immediate effect on the headache and joint pains. The disease has nothing in common with tick fever. Its virus has characteristics that completely differentiate it from that of a mild typhus. Arsphenamine as a remedy is useless.

Medical Service for Natives

The neglect of the native territories, so far as education and medical service are concerned, has been a blot on the administration of the various governments since the union was established. Public opinion has now forced the present government, which is in many ways, especially where health questions are concerned, behind its predecessor, to make an attempt to deal with one phase of the problem of medical aid to natives. In the protectorates too the matter is now receiving attention. The scheme of the protectorates provides for a common sense course for medical aids, much on the lines that have been developed in Java. That of the union government is more ambitious and may lead to the creation of a class of second grade general practitioners practicing in the native territories only. A definite promise has been made, however, that the scheme will not be enforced before the medical association has had an opportunity to express its opinion on the details.

Deaths

Dr. Charles Porter, formerly medical officer of health for Johannesburg, has died of coronary thrombosis. He was a forceful personality, a barrister as well as a doctor, and one of the pioneers of child welfare work.

Dr. P. de V. Moll died this month as the result of a motor accident. He was one of the younger specialists and lecturer on orthopedics at the University of Cape Town.

Dr. D. M. Tomory, formerly medical officer of health for Bloemfontein, and Dr. A. C. Seale, formerly superintendent of the New Somerset Hospital, Cape Town, died last month.

Marriages

HERSHEL CLANTON LENNON, Wilmington, N. C., to Miss Myrtle Catherine Hendley of Ansonville, at Durham, June 16.

FERN WARD BUOOA, Des Moines, Iowa, to Miss Neoma Kistenmacher of Davenport, at Chicago, August 27.

DAWSON EDWARD WATKINS JR., Waynesboro, Va., to Miss Mary Evelyn Stephenson of Buena Vista, June 23.

JAMES WALTON LIPSCOMB JR., Columbus, Miss., to Miss Anne Elizabeth Dubard of Grenada, June 6.

LAURIE WALKER MOORE, Beaufort, N. C., to Miss Anne Pryor Neale of Lanesville, Va., June 2.

THOMAS ALLEN LACY, Brentwood, N. Y., to Miss Cornelia Archer of Montreat, N. C., June 30.

ROGERS NEWTON HARRIS, Port Royal, Va., to Miss Mary McLaughlin of Lynchburg, May 19.

CHARLES DUFFY, New Bern, N. C., to Miss Mary Pickett Breck of Maysville, Ky., April 17.

CHARLES W. LAWRENCE, Emporia, Kan., to Mrs. W. O. Thompson of Dodge City, July 2.

RUDOLPH ANGUS NICHOLS JR. to Miss Elizabeth Williams, both of Richmond, Va., June 1.

CARL C. CARRICO, Houston, Texas, to Miss Helen M. Murphy of Denison, August 4.

JULIUS CLEON JOSEY to Miss Mary Helen Lancaster, both of Spartanburg, S. C., June 9.

ROYALL MANN CALDER to Miss Laurie May booth, both of Durham, N. C., August 18.

EDWARD WILLIAM SACHS to Miss Mary Clare Smith, both of Dayton, Ohio, August 29.

JOHN LATZO, Wilmington, Del., to Miss Agnes Rynkiewicz of Tamaqua, Pa., recently.

ULIS B. HINE, Indianapolis, to Miss Geraldine Jeffries of Newcastle, Ind., June 24.

JAMES MORRIS PFEIFER, Lawrenceburg, Ind., to Miss Alice Helen Mueller, June 23.

WILLIAM BEVERLEY WILKINS, Alexandria, Va., to Miss Gladys Nichols, June 2.

ARCHER CHARLES BACHMEYER, Cincinnati, to Miss Mary Hicks, recently.

Deaths

Augustus Ravogli, Cincinnati; Regia Università di Roma degli studi Facoltà di Medicina e Chirurgia, Italy, 1873; chairman of the Section on Dermatology and Syphilology of the American Medical Association, 1896-1897; member and past president of the American Dermatological Association; member of the American Urological Association; fellow of the American College of Surgeons; for many years member and past president of the Ohio State Medical Board; past president of the Cincinnati Academy of Medicine; professor emeritus of dermatology and syphilology, University of Cincinnati College of Medicine; formerly on the staff of the Cincinnati General Hospital; author of "Syphilis in Its Medical, Medico-Legal and Sociological Aspects"; aged 83; died, July 25, in the Deaconess Hospital, of cerebral hemorrhage, arteriosclerosis and chronic nephritis.

Samuel Kemp Merrick, Ruxton, Md.; University of Maryland School of Medicine, Baltimore, 1872; member of the Medical and Chirurgical Faculty of Maryland; fellow of the American College of Surgeons; professor emeritus of rhinology and laryngology at his alma mater; past president of the Baltimore City Medical Society; member of the Board of Regents of the University of Maryland; for many years on the staff of the Maryland General Hospital, Baltimore; aged 86; died, July 24, of heart disease.

Peter W. Tomlinson ✙ Wilmington, Del.; Jefferson Medical College of Philadelphia, 1878; member of the House of Delegates of the American Medical Association, 1907-1908, in 1919, in 1926 and in 1931; past president, secretary and councilor of the Medical Society of Delaware; past president of the board of medical examiners; consulting medical director of the Continental American Life Insurance Company; aged 84; died, July 25, in the Beebe Hospital, Lewes, of pneumonia.

Henry Louis Stick ✙ Canandaigua, N. Y.; College of Physicians and Surgeons, Baltimore, 1900; member of the Medical Society of the State of Pennsylvania, the American Psychiatric Association and the New England Society of Psychiatry; served during the World War; aged 61; on the staff of the Veterans' Administration Facility, where he died suddenly, August 15, of cerebral hemorrhage.

Albert Winslow Horr ✙ Boston; Boston University School of Medicine, 1891; emeritus professor of ophthalmology at his alma mater; member of the New England Ophthalmological Society; fellow of the American College of Surgeons; consulting ophthalmic surgeon to the Massachusetts Memorial Hospitals; aged 69; died, August 3, of angina pectoris, at Watertown, N. Y.

James Spencer Brown, Pinehurst, N. C.; College of Physicians and Surgeons, Medical Department of Columbia College, 1885; served during the World War; for many years on the staff of the Mountainside Hospital, Montclair, N. J.; fellow of the American College of Surgeons; aged 71; died, August 18, at his summer home in Malletts Bay, Vt., of pneumonia.

Frederick Ernest Wilcox ✙ Willimantic, Conn.; New York Homeopathic Medical College, 1884; member of the Connecticut Homeopathic Medical Examining Board; past president of the Windham County Medical Society; on the staff of the Windham Community Memorial Hospital; aged 74; died, August 8, of uremia and pyelonephritis.

Goode Cheatham, Henderson, N. C.; North Carolina Medical College, Davidson, 1895; past president of the Vance County Medical Society; formerly county health officer; past president of the Association of Seaboard Railway Surgeons; aged 59; died suddenly, August 3, of coronary thrombosis, at the home of his son in Endicott, N. Y.

Merchant William Colgin, Waco, Texas; Vanderbilt University School of Medicine, Nashville, Tenn., 1905; member of the State Medical Association of Texas; fellow of the American College of Physicians; past president of the McLennan County Medical Society; part owner of the Colgin Hospital and Clinic; aged 51; died, July 15.

Lyle Joseph Willis, Fort Madison, Iowa; University of Illinois College of Medicine, Chicago, 1929; member of the Iowa State Medical Society; medical superintendent of the Atchison, Topeka and Santa Fe Railway Hospital; aged 33; was killed, August 11, when a gun he was cleaning was accidentally discharged.

Lawrence Rosboro Craig, Franklin, La.; Medical College of Virginia, Richmond, 1906; served during the World War; director of St. Mary Parish Health Unit; aged 52; died, August 5, in the Army and Navy General Hospital, Hot Springs National Park, Ark., following a fracture of the fourth dorsal vertebra.

Arthur Mitchell, Medfield, Mass.; Boston University School of Medicine, 1886; member of the Massachusetts Medical Society; formerly on the staffs of the Framingham (Mass.) Union Hospital and the Leonard Morse Memorial Hospital, Natick; aged 70; died, July 24, in the Corey Hill Hospital, Brookline.

Nathaniel Thackery Stevens ✙ Clifton, Ill.; Queen's University Faculty of Medicine, Kingston, Ont., Canada, 1892; past president of the Kankakee County Medical Society; on the staff of St. Mary Hospital, Kankakee; aged 70; died, July 26, at the North Shore Health Resort, Winnetka.

Gurney Claycomb Wallace, Denver; Denver and Gross College of Medicine, 1906; member of the Colorado State Medical Society; veteran of the Spanish-American War; formerly demonstrator of anatomy at his alma mater; on the staff of the Presbyterian Hospital; aged 56; died, July 7.

Benjamin H. Blair ✙ Lebanon, Ohio; Louisville (Ky.) Medical College, 1876; member of the House of Delegates of the American Medical Association, 1910-1911; county health officer; for many years member and president of the board of education; aged 79; died, August 15, of heart disease.

Charles E. Wilkerson, Greensboro, N. C.; University of Nashville (Tenn.) Medical Department, 1907; member of the Medical Society of the State of North Carolina; formerly a medical missionary; on the staffs of the Clinic Hospital and the Wesley Long Hospital; aged 55; died, July 13.

Jean Beatrice Christie, Newberry, Mich.; Woman's Medical College of Pennsylvania, Philadelphia, 1912; member of the Michigan State Medical Society; for many years on the staff of the Newberry State Hospital; aged 55; died, July 23, of chronic myocarditis and arteriosclerosis.

Ralph Salem Heilman, Sharon, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1907; member of the Medical Society of the State of Pennsylvania; served during

the World War; medical director of the Protected Home Circle; aged 54; died, July 19.

Roy A. Windham ✠ Port Huron, Mich.; Detroit College of Medicine, 1912; past president of St. Clair County Medical Society; on the staff of the Port Huron Hospital; aged 55; died, July 18, of arteriosclerosis and coronary and cerebral thrombosis.

David Phipps Rettew, Coatesville, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1890; member of the Medical Society of the State of Pennsylvania; aged 68; died, July 11, in the Pennsylvania Hospital, Philadelphia.

George A. Whitledge ✠ Anderson, Ind.; University of Louisville (Ky.) School of Medicine, 1891; fellow of the American College of Surgeons; aged 65; on the staff of St. John's Hospital, where he died, July 4, of heart disease.

Ralph Waldo Holbrook ✠ Kansas City, Mo.; Kansas City Medical College, 1904; past president of the Jackson County Medical Society; aged 54; on the staff of the Research Hospital, where he died, August 22, of heat prostration.

Robert Wesley Hallenberg ✠ Bismarck, N. D.; University of Illinois College of Medicine, Chicago, 1932; on the staff of St. Alexius Hospital; aged 29; died, August 1, of skull fracture received in an automobile accident.

William Joseph Siegler ✠ Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1910; on the staff of the Evangelical Hospital; aged 59; died, August 17, of angina pectoris.

John William Nelson, Jamestown, N. Y.; Columbia University College of Physicians and Surgeons, New York, 1896; aged 67; died, in June, as the result of a severed artery in his thigh, self inflicted with a piece of glass.

Francis Thomas Ridley, Bluefield, W. Va.; University of Virginia Department of Medicine, Charlottesville, 1903; member of the West Virginia State Medical Association and the Medical Society of Virginia; died, July 19.

Samuel Lowery Adair Jr., Jeffersonville, Ind.; Kentucky University Medical Department, Louisville, 1904; city health officer and formerly county health officer; aged 54; died, August 2, of a self inflicted bullet wound.

Trusten Mitchell Hart ✠ Los Angeles; University of California Medical Department, Los Angeles, 1911; on the staff of the Los Angeles County General Hospital; aged 53; died suddenly, July 14, of heart disease.

Carl Friedrich Wolff, New York; Bellevue Hospital Medical College, New York, 1885; aged 70; died, August 7, in the Southampton (N. Y.) Hospital, of a skull fracture received in an automobile accident.

Simeon Gould Start, Cambridge, Vt.; Bellevue Hospital Medical College, New York, 1895; member of the Vermont State Medical Society; aged 64; died, June 20, in the Fanny Allen Hospital, Winooski.

Eugene Eliel Brunson, Ganges, Mich.; Bennett College of Eclectic Medicine and Surgery, Chicago, 1875; past president of the Ottawa County Medical Society; aged 82; died, August 5, of pneumonia.

George Russell Beck, Detroit; University of Michigan Medical School, Ann Arbor, 1926; aged 31; was drowned, August 11, in Northport Bay when the sailboat in which he was riding capsized.

Cyrus A. Kirkley, Los Angeles; Starling Medical College, Columbus, 1868; member of the Ohio State Medical Association; fellow of the American College of Surgeons; aged 89; died, July 27.

Thomas G. Cooksey, Converse, S. C.; Louisville (Ky.) Medical College, 1890; member of the South Carolina Medical Association; aged 68; died, July 17, in a hospital at Spartanburg.

Bishop Wash ✠ Cornishville, Ky.; University of Louisville (Ky.) School of Medicine, 1893; past president of the Mercer County Medical Society; aged 65; died, July 25, of cerebral hemorrhage.

Suther Corbett Murray, Sackville, N. B., Canada; Harvard University Medical School, Boston, 1871; aged 88; died, April 28, in the Moncton (N. B.) Hospital, of cerebral hemorrhage.

Charles Frederick Hunt ✠ New York; Columbia University College of Physicians and Surgeons, New York, 1898; served during the World War; aged 59; died, August 2, of cancer.

Lonnie L. Wright, Boaz, Ky.; Hospital College of Medicine, Louisville, 1907; member of the Kentucky State Medical Association; aged 53; died suddenly, July 16, of heart disease.

Charles Willis Many, Doylestown, Pa.; Long Island College Hospital, Brooklyn, 1894; served during the World War; county health officer; aged 66; died, July 27, of myocarditis.

William T. Campbell ✠ Brown City, Mich.; Saginaw (Mich.) Valley Medical College, 1899; for twelve years member of the city council; aged 66; died, August 10, of angina pectoris.

Norman Randolph Cook, Newport, Maine; University of Vermont College of Medicine, Burlington, 1896; member of the Maine Medical Association; aged 63; died, June 30.

Frederick John MacDonald, Schenectady, N. Y.; Albany (N. Y.) Medical College, 1903; city health officer; aged 54; died, August 8, at Rochester, Minn., of hypertension.

Newell Wesley Beane, East Kingston, N. H.; Dartmouth Medical School, Hanover, 1883; member of the state legislature; aged 75; died, August 1, of heart disease.

Pinkney Lee Davis, Baltimore; University of Maryland School of Medicine, Baltimore, 1888; police surgeon; aged 74; died, July 9, of a self inflicted bullet wound.

Stuart Mills Watson ✠ Newark, Ohio; University of Cincinnati College of Medicine, Cincinnati, 1931; aged 37; was killed, July 14, in an automobile accident.

Harve George Young, Toledo, Ohio; University of Michigan Homeopathic Medical School, Ann Arbor, 1893; aged 62; was found dead, June 2, of a gunshot wound.

Boleslaus Klarkowski, Chicago; Illinois Medical College, Chicago, 1903; formerly member of the board of education; aged 71; died, August 20, of lobar pneumonia.

James M. O. Bruner, Port Byron, Ill.; College of Physicians and Surgeons of Chicago, 1887; aged 75; died, August 14, in the Methodist Hospital, Brooklyn.

Dudley H. Smith, Florence, S. C.; Medical College of the State of South Carolina, Charleston, 1904; aged 55; died, July 28, of cerebral hemorrhage.

Harvey Combs Asher, Chicago; Northwestern University Medical School, Chicago, 1907; aged 51; died, July 31, of a self inflicted bullet wound.

G. Parker Dillon ✠ Sacramento, Calif.; Detroit College of Medicine, 1896; aged 62; died, July 17, in the Sacramento Hospital, of cholecystitis.

David Osborn, Stockdale, Ohio; Kentucky School of Medicine, Louisville, 1894; aged 68; died, June 24, in a hospital at Shelbyville, Ind.

Frank Sherman Alexander, St. Louis; American Medical College, St. Louis, 1903; aged 66; was found dead, July 28, of heat prostration.

Richard Peter Pattee, Hawkesbury, Ont., Canada; McGill University Faculty of Medicine, Montreal, Que., 1874; aged 83; died, April 3.

James Milton Montgomery, Smith's Falls, Ont., Canada; Queen's University Faculty of Medicine, Kingston, 1924; aged 32; died, April 4.

James Robert Hunt ✠ Macon, Mo.; Beaumont Hospital Medical College, St. Louis, 1897; aged 60; died, July 25, of heat prostration.

Ernest Herbert Brittin, Auburn, Ill.; Barnes Medical College, St. Louis, 1902; aged 59; died, August 7, of cerebral hemorrhage.

Charles W. Wyman, Kansas City, Mo.; Ensworth Medical College, St. Joseph, 1904; aged 56; died, July 21, of heat prostration.

George Harper Bland, Fresno, Calif.; College of Physicians and Surgeons of San Francisco, 1901; aged 64; died, June 13.

William L. Gaddie, Upton, Ky.; Hospital College of Medicine, Louisville, 1889; aged 72; died, July 8, of chronic nephritis.

Augustus H. Brantly, Atlanta, Ga.; Atlanta Medical College, 1866; Civil War veteran; aged 90; died, July 20, of heart disease.

Ralph William Bicknell ✠ Winthrop, Maine; Tufts College Medical School, Boston, 1912; aged 48; died, June 7.

Tracy H. Smith, San Leandro, Calif.; University of California Medical Department, 1876; aged 83; died, June 24.

Duncan McEdwards, Hamilton, Ont., Canada; Trinity Medical College, Toronto, 1886; aged 73; died, April 26.

David H. Yates, Madison, Fla.; Atlanta Medical College, 1894; aged 68; died, June 21, of Raynaud's disease.

Donald McLeod, Toronto, Ont., Canada; Trinity Medical College, Toronto, 1890; aged 67; died, April 19.

Correspondence

POPULAR HEALTH EDUCATION

To the Editor:—Driven by a constant bombardment of ridiculous references by patients to library books, I undertook to investigate the popular medical volumes on the shelves at the Springfield Public Library. The result of the investigation was astounding. Most of the books were either so antiquated as to beg retirement or else bore such ignorant, preposterous or downright quack authorship as to make one exclaim with horror. The biggest shock, however, came when in response to a call for assistance, one of the librarians suggested the late Alfred McCann's "The Science of Eating" as a very good book on diets. That McCann (see THE JOURNAL, June 20, 1925, and March 15, 1930) should have created such a piece of quackery is only natural, but that a city library would circularize and even recommend it to its citizenry was rather hard to understand.

An effort to present this unsatisfactory state of affairs before the local library authorities as well as to the public in the form of an open letter to the Springfield *Republican* so far has brought no results.

It is high time that the profession took steps to remedy this perplexing situation. The creation of a committee of experts for the evaluation of popular medical books is to be hailed as a step in the right direction.

MAX MILLMAN, M.D., Springfield, Mass.

WORKMEN'S COMPENSATION ACTS AND PHYSICIANS' FEES

To the Editor:—On July 3, 1934, there ended in the Circuit Court of [Cook County] Illinois a case which will be instructive to all doctors who take care of the occasional case of an employee injured while at his work.

In 1930 one of my regular patients came to me with a hand infection produced by an injury occurring during his work. I treated him. The last time was about forty days after the injury. A week after he first consulted me the Continental Casualty Company sent me a blank form asking for a report on his injury, which I filled out and returned to them. The same was done with one or two later report blanks.

After the patient was well I sent him a bill for services, making my regular charges to him as to any of my other patients. A few days later I received a letter from the insurance company asking for an itemized bill, which I sent them. Later I received a check from the insurance company for about 50 per cent of my bill and a letter saying that the check was in conformity to fees they were regularly paying to other doctors. I returned the check with a letter saying that the fees charged were my regular fees which I expected to be paid, that I did not allow any one else to determine the value of my services, and that I did not do enough work for them to justify giving them a special price or discount.

Later I received from them a letter saying that my charges "were not in conformity with the usual and customary rates and were considerably more than the amount designated by the Industrial Commission of this state which has jurisdiction over such matters." They tried to deceive me into believing that the Industrial Commission had established a fee schedule.

I replied that the Industrial Commission had no jurisdiction over my fees to my private patients. Later I sued the patient for the bill in a justice court and got a judgment, though the insurance company lawyer represented him and tried to persuade the justice that the Industrial Commission had set certain fees. He then appealed the case and the appeal recently came to trial with the result that my bill was allowed.

The Chicago Medical Society furnished an attorney to represent me at both trials with the hope of establishing a precedent against these "chiseling" insurance companies. The society has now won two other such cases.

Let me state just what this case determines for you.

1. You can collect your regular fees in cases of industrial accidents if you have not made any agreement as to fees with the employer or the insurance company.

2. The Industrial Commission or even the state of Illinois cannot set your fees. If there is a dispute the court or perhaps the Industrial Commission, in case of workman's compensation, may pass on reasonableness of the fees.

3. Don't let the insurance company "bluff" you out of your regular fees if you have made no definite agreement with them.

4. The Chicago Medical Society is working to protect your financial interests.

LESLIE W. BEEBE, M.D., Oak Park, Ill.

[COMMENT.—The following comment is offered by the Bureau of Legal Medicine and Legislation.—ED.]

The workmen's compensation acts of the several states are not uniform. Some of them probably contain provisions differing in detail from those to be stated. What is here stated, however, is believed to represent the prevailing rule.

Workmen's compensation acts do not regulate contracts of physicians with injured workmen whom they treat, or with the employers of such workmen, or with the insurance carriers of such employers. They go no further in this connection than to authorize workmen's compensation boards to award, within statutory limits, to an injured workman, among other items, a sum theoretically sufficient to reimburse him for money which he has paid or has obligated himself to pay for medical services that his employer wrongfully failed to provide.

An employer or an insurance carrier that requests a physician to attend an injured workman, without agreeing on a stated amount to be paid for his services, is liable in an action at law for the reasonable value of such services, to be determined by the court.[1] Workmen's compensation boards have nothing to do with the fees that a physician collects under his contracts with employees, employers and insurance carriers. As a matter of fact, workmen's compensation acts do not provide methods by which physicians can on their own initiative recover their fees for such services, although if an injured workman files a claim for compensation that includes the amount he has paid or is obligated to pay for medical service, the physician by filing his claim against the workman may in some states establish what amounts to a lien on any award in the workman's favor. The physician must have recourse to the courts and the ordinary processes of law,[2] if he would establish his claim directly against an employer or an insurance carrier.

An injured workman who requests a physician to attend him is personally liable, in the absence of an express or implied agreement to the contrary, for the reasonable value of the physician's services. An award made by a workmen's compensation board in favor of the workman and against his employer does not limit the amount the physician can recover from the workman in an action at law.[3] A physician may, however, bind himself by an express or implied contract to accept whatever amount the board awards the workman. If, for instance, a physician has customarily demanded of injured workmen whom he has treated fees equal to the amounts awarded to such workmen by the workmen's compensation board for medical service, a court may reasonably conclude that the physician always limits his fees in such cases in that manner

1. 72 American Law Reports 1016 and cases there cited; Knox Stove Works v. Hodge (Tenn.), 289 S. W. 505.
2. Wilson Drilling Co. v. Beyer (Okla.), 280 P. 846; Robinson v. Taylor (Okla.), 244 P. 47; Bloom v. Jaffe (N. Y.), 94 Misc. 222, 157 N. Y. S. 926.
3. Noer v. Jones Lumber Co. (Wis.), 175 N. W. 784.

and that the workman entered into his contract for medical services in reliance on the physician's custom. Moreover, if in any particular community the entire medical profession customarily accepts in satisfaction of all charges for medical service rendered injured workmen the amounts awarded to such workmen for medical service by the workmen's compensation board, that custom, in the absence of an express or implied agreement to the contrary, may operate to limit the amount that the court will award a physician. In any case, the court will endeavor to ascertain the true intent of the physician, the employer, the insurance carrier and the workman when an agreement or contract for medical service is entered into and will see that the agreement or contract is enforced in a manner that accomplishes that intent.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

"THYMIC DEATH"

To the Editor:—A multipara with a markedly contracted pelvis gave a history of two previous deliveries with high forceps, one child dying at birth and the other twenty-four hours later. The second was blue and never cried lustily and was given oxygen and stimulants to no avail. In view of the history and a markedly contracted pelvis, I did a cesarean section, April 17, at full term. This child had the same appearance of the preceding one. After one hour the color was good and a few breath sounds could be heard. Oxygen and carbon dioxide were given for ten hours with a catheter inserted but the child died. From the history I believe that all three possibly died because of an enlarged thymus. This child post mortem was normal except for a markedly enlarged thymus, much firmer in consistency than normal. The lungs were completely atelectatic except in the upper lobes. With this history could any prenatal plan of treatment be instituted to guard against this again? Is it common for a mother to have more than one child with an enlarged thymus? Physical examination and blood tests on the mother, child and father were negative except as given for the child. Would you let me know what can be found in the literature as soon as possible for report at our hospital staff meeting? Please omit name if published.

M.D., Washington.

ANSWER.—There is a form of sudden death in new-born infants which has been designated by the term "thymic death." This term does not indicate a mode of death by suffocation, coming on after symptoms of obstruction. It is rather a totally unexpected death by asphyxia which occurs in infants immediately after birth, a few hours later or, more rarely, during the first few days. If the case is an early one the infant may be quite healthy and show no signs of respiratory embarrassment. If late, the infant may have already manifested some stridor, and death occurs during a sudden exacerbation. Two explanations are commonly offered to account for the rôle of the thymus in the causation of sudden death during this period. The gland possibly presses against the trachea and large vessels and thus mechanically causes suffocation and death; or death may be the result of status thymicolymphaticus, an anomaly of the constitution which is held responsible for sudden and unexpected deaths of apparently healthy individuals later in life. Most authorities consider that "thymic death" in newborn infants is to be explained on the mechanical theory. If the infant dies shortly after birth, before complete recovery from asphyxia of the labor, it cannot be assumed that the thymus was the one and only cause unless there is anatomic proof of the enlargement of the gland and of its pressure on the trachea and the large blood vessels. Such cases have been described in the literature but there have been no reports occurring in successive members of the same family. As early as 1906, Hedinger reported the deaths shortly after birth, with signs of asphyxia, of seventeen apparently healthy infants. In all these cases, necropsy revealed a more or less pronounced hypertrophy of the thymus; but enlargement of the thymus without symptoms occurring in more than one member of the same family is not uncommon. The incidence of an enlarged thymus in the new-born varies with the type of infant. For example, infants with congenital defects and malformation have an incidence of over 30 per cent.

Lately there has been some doubt in regard to the causal relationship of an enlarged thymus to sudden death. That the question of sudden death in infants is a more complex one than can be simply explained by a local cause is indicated not only by presumption of an associated morbid diathesis, status thymicolymphaticus, but also by the association of other constitutional deviations and endocrine defects. Cases of sudden death are recorded in which the necropsy fails to reveal the slightest enlargement of the thymus; and even when a large thymus is found with symptoms of tracheal compression, the actual cause of death may be something quite different. One can only recognize that the thymus may produce signs of obstruction and that this may be the cause of death in some cases. There is no scientific basis, however, for asserting that the thymus is the cause of sudden death by asphyxia which occurs immediately after birth or within the first few days unless it can actually be shown that the thymus produced obstruction. G. F. Still (*Lancet* **1**:431 [March 3] 1923) called attention to five cases showing sudden arrest of respiration immediately after birth and days later in infants apparently healthy. No cause was definitely decided on. A little later Cruickshank called attention to the pressure of the contracting uterine walls on the infant as one of the causes for asphyxial congestion. He is of the opinion that asphyxial congestion is the most usual factor in producing hemorrhage. Such hemorrhage may be in the nature of tiny hemorrhages in the pons. Kirkwood, Myers and Lumsden (*Lancet* **2**:65 [July 14] 1923) believe that hemorrhage into the pons is doubtless an unrecognized cause of death in new-born infants with inspiratory apnea. Cerebral hemorrhage, atelectasis, congenital debility and suprarenal changes are other causative factors for sudden death in the new-born period which should not be overlooked even in the presence of an enlarged thymus.

In the present state of knowledge there is no effective prenatal treatment to guard against an enlarged thymus in the new-born infant. Irrespective of one's conception of how symptoms are produced, the value of roentgen therapy for enlargement of the thymus during the neonatal period, however, is tangible.

LOSS OF HAIR

To the Editor:—Can you tell me what possible deficiency might exist in the case of a patient who has progressive loss of hair, with absence of any known disease, and a scalp that has no appearance of being diseased? If you cannot give me this information, can you tell me where I can get it?

M.D., Conn.

ANSWER.—Progressive loss of hair (alopecia) may be seen as senile alopecia occurring most frequently in men and developing in advancing years. It is thought in some instances to be a result of the cutaneous atropic changes associated with old age. Since the loss of hair in these cases is usually on the vertex and above the forehead, where pressure of the aponeurosis of the occipitofrontalis muscle is greatest, this is thought to be a factor. A mild seborrhea, so slight as to escape notice, undoubtedly exists in many cases. Premature baldness (alopecia prematura) is divided etiologically into idiopathic and symptomatic. Idiopathic alopecia is in many instances hereditary, and the stretched condition of the aponeurosis of the occipitofrontalis muscle, which becomes hereditary in certain families, is stressed by Pincus as a factor. He also states that a chronic eczema or impetiginous eruption of the scalp, in the years preceding puberty, is a more frequent cause, and that it is often associated with symptoms of relative or absolute debility. Because of the prevalence of this type of baldness in those leading sedentary lives and in brain workers, Jamieson advances the theory that the nerves supplying the scalp are in direct connection with those supplying the coverings of the brain and that an irritable condition of the brain due to cerebral congestion would reflexly interfere with hair growth. Compression of the anterior temporal arteries by stiff hats, which also excludes sunlight and air, have been assigned as causes. Undue exposures to the rays of the sun without head covering is given significance by Harding. Lack of care of the hair and excessive use of water are also considered factors.

The symptomatic variety of premature alopecia has a recognizable cause, which differs widely in each case. The hair loss may result from general or local disease of the scalp or body. It may occur after fevers or severe acute systemic disease (defluvium capillorum) when it is rapid, or the hair loss may be slow as in alopecia pityroides, in which seborrhea is a factor, and this is probably the most frequent local cause of alopecia.

Conditions affecting the patient generally, such as anemia, anxiety and worry, dyspepsia, rheumatism, malaria, the menopause and neurotic disturbances, are cited as predisposing causes by Jackson and McMurtry (Diseases of the Hair, Philadelphia, Lea & Febiger, 1912). Endocrine factors related

to deficiencies of the anterior pituitary gland (Bengtson, B. N.: Pituitary Therapy of Alopecia, THE JOURNAL, Nov. 7, 1931, p. 1355) have received attention as causal factors. The rôle of the thyroid in the alopecias has also been stressed. While endocrine therapy has given results in individual cases, these results on the whole have been variable and inconclusive. The toxic action of certain drugs, such as thallium and arsenic, in the production of baldness must be considered, and the possible contributory factors of these drugs should be ruled out in every case.

The rôle of sulphur in alopecia has recently been reviewed by Brown and Klauder (Sulphur Content of Hair and of Nails in Abnormal States, *Arch. Dermat. & Syph.* **27**:584 [April] 1933). They feel that the metabolism of sulphur is only one phase of the mechanism of the growth and loss of hair and state that "this mechanism apparently involves an interplay of other factors, notably the endocrine glands and the sympathetic nervous system."

HEMATOMA AFTER EXTRACTION OF TOOTH

To the Editor:—A woman, aged 25, had the upper left first molar extracted, under local anesthesia (procaine hydrochloride) one year ago. This extraction was followed by swelling over the left zygomatic bone and infra-orbital region the following day. This region became discolored (ecchymotic) about seven days later. The discoloration and swelling varied in amount and intensity throughout the next ten months, associated with considerable pain. The condition had improved to some extent at the end of that time. One month ago (ten months after the first extraction) the upper right first molar was extracted under local anesthesia. This was followed by swelling and discoloration over the right zygomatic bone and infra-orbital region the next day. This condition, accompanied by considerable pain, has persisted up to the present time. Neither extraction was followed by loss of more than a few drops of blood. Seven years ago the patient suffered a "nervous breakdown." Thyroidectomy was performed without improvement in the symptoms, according to her statement. For two or three years following this operation she was treated in nervous and mental institutions. She has been under home treatment for the past three years. She is still extremely nervous and starts crying at slight provocation. She has had four other molars extracted under local anesthesia during the past few years without untoward results. The Wassermann reaction is negative. There is no history of purpura. The left side of the face is still improving. Physical examination is essentially negative except for the condition noted and extreme nervousness. Roentgen examination seven months after the extraction of the upper left first molar revealed no infection or bone injury at the site of the extraction. Laboratory and other examinations one month before the second extraction revealed: red blood cells, 5,010,000; white blood cells, 10,200; hemoglobin, 95 per cent; polymorphonuclears, 48 per cent; lymphocytes, 52 per cent; clotting time, two minutes. Urinalysis was negative for albumin, sugar and pus; the specific gravity was 1.018. The blood pressure was 120 systolic, 80 diastolic; pulse, 100; temperature, 98. I feel that this condition is due to repeated self-inflicted trauma arising from a desire for sympathy. Could there be a pathologic cause for this condition? Kindly omit name and address if this is published.

M.D., Virginia.

ANSWER.—Hematoma following the extraction of teeth under local anesthesia is not uncommon. Sometimes the swelling and discoloration appear immediately, even before the hypodermic needle is removed. More commonly it occurs a number of hours later or on the following day. In rare instances it is recurrent, lasting for a few weeks; but the condition recurring over ten months has not been observed. We know of no other condition that could produce the symptoms described.

BRACHIAL PLEXUS INJURY DURING BIRTH

To the Editor:—A baby, delivered with considerable difficulty by breech extraction, some ten days ago, appears to have an upper arm paralysis on the left side. For the first two days it was observed that the infant moved only its fingers. Gradually movements of the wrist and forearm have appeared, but so far no movements of the upper part of the arm have been observed. The arm assumes a position of inward rotation with the thumb pointing backward. Apparently the paralysis involves the deltoid, infraspinatus and supraspinatus muscles, which constitutes, I believe, the Erb-Duchenne type of paralysis. What is the prognosis of this type of injury? Can anything be done to restore function? Is there any particular position in which the arm should be placed and held? Please omit name.

M.D., Wisconsin.

ANSWER.—The clinical picture of a baby which has not moved its arm from the time of birth but with gradual increase of the movements of the fingers, wrist and forearm suggests at once a brachial plexus injury which probably resulted from overstretching the nerves of the brachial plexus during the delivery of the aftercoming head. Such paralysis may involve almost wholly the nerves supplying the muscles by which the arm is moved at the shoulder and constitutes the typical Erb-Duchenne syndrome.

When the hand and wrist muscles are involved and not the shoulder, the injury is usually due to traction on the arm in a breech delivery. The eighth cervical root and the first thoracic nerve roots are involved in this Klumpke paralysis. Usually, however, the paralysis is of the whole arm type but more severe in the upper or lower part of the arm, as the case may be.

The treatment should be one of protection through splinting with the arm held in a strap hanger or airplane splint which maintains 90 degrees abduction and, as nearly as possible, complete external rotation. If the hand is involved, the upright part of the splint should have a flat surface at the side of the hand, to which the fingers should be strapped in the extended position. This splint should be worn for twenty-four hours a day for several days and should be removed only for bathing the baby. After one week it is advisable to remove the splint for one hour each morning, during which the arm is allowed to rest at the infant's side and the shoulder and arm may be gently massaged. After two weeks the splint should be removed for one hour both morning and afternoon and each time the arm should be massaged for about fifteen minutes. If the recovery of the muscles has been quite definite, it will then be safe to leave the splint off for two hours morning and afternoon and permit the infant to use the arm as much as possible during that interval. The length of time which the splint is removed should be increased at the rate of an hour a week until it is left off all day after from three to four months. If there is still weakness at this time in the shoulder muscle group, it is advisable to continue wearing the splint at night for as long as a year or until such time as a normal range of active shoulder motion is definitely established. This splinting relaxes the tension on the brachial plexus and also prevents contractures of muscles or ligaments about the shoulder.

The prognosis for about 70 to 80 per cent recovery in most of these cases is good. Occasionally these infants seen during the first few days after delivery with apparently total whole arm paralysis make so nearly a complete recovery that an examiner cannot detect any weakness when the patient is 1 year of age.

NUPERCAINE AND TOXICITY OF LOCAL ANESTHETICS

To the Editor:—There are hospitalized at this facility about 1,700 patients. Almost every conceivable type of disease is to be found at one time or another among this large group of patients. From time to time attention is called to new anesthetics, both local and general. We have no desire to be the last to try out new remedies, but on account of the nature of our work and the fact that this is more or less a public institution, we must maintain a certain amount of conservatism in the use of new anesthetics. Nupercaine (Ciba) is one of the newer local anesthetics and, from the description given in New and Nonofficial Remedies, one is led to believe that it possesses a high degree of toxicity. A great deal of local anesthesia is used in our genito-urinary department, eye, ear, nose and throat department, cancer service, and in some cases of tuberculosis of the larynx. If nupercaine may be used generally with safety, we are anxious to give it a trial. However, before attempting its use extensively, a few questions should be answered satisfactorily. 1. May this local anesthetic be injected into the larynx in a 2 per cent solution? If not, what percentage should be considered as the limit of safety? Also, what quantity should be used? This question is prompted by the fact that in your description you mention that cases have been reported in which it caused necrosis of the tissue. 2. May a 2 per cent solution be injected into the urethra? If so, in what quantity? 3. May this solution be used in eye work? Is there any danger of necrosis when used in this manner? If nupercaine has proved to be more than ordinarily toxic, we should like to know and we shall not adopt it as a local anesthetic.

W. E. KENDALL, M.D., Hines, Ill.

ANSWER.—When one is warned that a given local anesthetic is highly toxic, one is prone to forget that the toxicity of a substance may be actually high but may be relatively low; and it is the relative toxicity of an active substance that determines the safety with which it may be used by one who understands its possibilities and limitations. It is the accepted policy of the Council on Pharmacy and Chemistry not to accept a new local anesthetic merely because it is capable of inducing anesthesia, and before accepting a new substance of this class for New and Nonofficial Remedies the Council demands evidence that it possesses some advantage over other well known local anesthetics.

The important thing to be borne in mind constantly when one uses any local anesthetic for any purpose is to use the smallest amount and the lowest concentration that are effective. The Committee for the Study of the Toxic Effects of Local Anesthetics (THE JOURNAL, March 15, 1924) concluded that the local anesthetics may be used safely if the conditions laid down in the report are observed.

It is well known that, grain for grain, nupercaine is more toxic than procaine, but it is also more active in inducing local anesthesia; consequently, much less of it is required. It has the advantage that the anesthesia induced usually lasts for from two to three hours or even longer, whereas the anesthesia induced by procaine usually does not last more than two hours and often less than that. It is plain, therefore, that a local

anesthetic of the nupercaine type is desirable for those operations which cannot be completed in less than two hours.

It is a remarkable fact that the more active local anesthetics are often used in doses comparable to those of procaine, in entire disregard of the known difference in toxicity. It is no cause for wonder that fatal accidents have resulted from such misuse of these local anesthetics.

1. The 2 per cent solution of nupercaine is intended for local application in the throat and nose; procaine is preferable for injection, or one may inject small amounts of nupercaine 1:1,000, to which may be added one-tenth its volume of epinephrine solution 1:1,000; that is, 0.1 cc. of the epinephrine solution to each cubic centimeter of nupercaine solution 1:1,000. Necrosis of the tissue may occur after the use of any local anesthetic, and one does not know in any case when such an accident may happen. It occurs but seldom when any of the local anesthetics is used properly.

2. It is distinctly dangerous to inject an effective dose of any of the local anesthetics in common use into the urethra in the presence of trauma. Disregard of the oft repeated warning has been responsible for many fatalities. The manufacturers themselves urge great caution when injecting nupercaine into the urethra in greater concentration than 1:500, and it does not seem justifiable to use a solution of ten times that concentration. Some observers have found a solution of 1:2,000 effective.

3. The manufacturers warn of the danger of using a concentrated solution of nupercaine in the eye and state that drying and cloudiness of the cornea may result from the use of a solution of 1:100. They state that it may be used in the eye with safety in the concentration of 1:1,000.

PSYCHOSIS OF GAS POISONING

To the Editor:—What effect would the following composition of fumigating gases have on a patient eighteen months after exposure: cyanide chloride, cyogen chloride, sodium cyanide and inert materials? The specific case I have reference to concerns a woman, aged 25, well developed, well nourished, fairly intelligent, circumstances poor. She and her sister were both overcome by the foregoing mixture of gases when an adjoining apartment was fumigated in November 1932. What followed immediately afterward is rather vague, although the sister was evidently unconscious for several hours but recovered. My patient ran to an open door when she felt herself becoming dizzy and did not lose consciousness. There was some vomiting, with considerable fright. I saw her for the first time in February 1934. She said that she had not been well since the accident, although no physician had attended her. Chief complaints were "sinking spells" with her heart, insomnia, flatulence and general weakness. The former history was negative except for renal calculus years before. Examination of the heart and lungs was negative. There were no murmurs. The pulse was rapid (120). The blood pressure was 120 systolic, 70 diastolic. The thyroid was palpable. No other signs of toxic thyroid were present other than the rapid pulse. A basal metabolism test and roentgen examination of the chest were not made, as the patient refused to assume financial obligations for this work. The conjunctivae were very pale. No symptoms were obtainable in the abdomen. No tenderness or masses were found. Examination of the extremities was negative. The patient was placed on an iron tonic and bromides. Feeling that she was not making progress, she requested a consultation. The consultant diagnosed the case as neurasthenia from the bizarre symptoms and absence of physical changes. At present the patient is ambulatory but contents herself with short walks and spends much of her time sitting in an easy chair or in the porch swing. When asked how she feels, she says that her "heart sinks" all the time. The sister has been under the care of a physician almost continuously since the accident, and while she appears much the less robust of the two she is able to get about quite well. Neither has worked since November 1932. A lawsuit is pending. My opinion is that the patient will make a rapid recovery when a settlement is made. What I want to know is whether you think her trouble would likely be due to the experience she had in 1932. What are the sequelae in patients who have recovered from cyanide gas poisoning? Two doctors who have gone over her carefully have said "there is just nothing that you can put your finger on in this case," and I am admittedly "up a stump." Can you help me? Kindly omit name if published.

M.D., Indiana.

ANSWER.—The symptoms here described originated in fright, not in the physical effects of the gas. Henderson and Haggard in "Noxious Gases," page 112, say that "nonfatal cases of poisoning (by hydrocyanic gas) result in headache, a feeling of suffocation, and some nausea; these symptoms pass off after several hours." Hamilton in "Industrial Poisons in the United States," pages 348, 350, says that "chronic cyanide poisoning from HCN and its compounds is certainly rare and there are even skeptics who refuse to believe that any indubitable cases have ever occurred." This author quotes from Reed (*J. Indust. Hyg.* **2**:140 [Aug.] 1920) reports of cases exhibiting dizziness, nausea, lacrimation, blurring of vision, gasping, coughing, staggering, prostration and irregular pulse. The men with these symptoms had been exposed every day for months. Authorities agree that, if death does not result from the immediate effects of cyanide poisoning, recovery is rapid and complete.

PTERYGIUM, OR MALADIE DE CROCODILE, IN PAPYRUS EBERS

To the Editor:—Costomiri, page 50, in his book on ophthalmology of ancient Greece, quotes Ebers as saying in the papyrus that the name maladie de crocodile is applied to the pterygium, because of a resemblance with the head of that animal. Hirschberg does not confirm what Costomiri has to say. I have neither the history nor the papyrus, yet I should like to have something definite on this point.

T. J. DIMITRY, M.D., New Orleans.

ANSWER.—It is rather difficult to answer this question without having the original papyrus of Ebers at hand. Ebers (George Móritz Ebers, a German Egyptologist, 1837-1894) obtained this famous papyrus from a citizen of Luxor in the winter of 1873-1874 and published the first edition in 1875. The papyrus was 30 cm. high and over 20 meters long and was written in hieratic script. Ebers' edition covered 108 pages, each with from twenty to twenty-two lines. Eight pages is devoted to ophthalmology, but the demarcation of this section was not sharp. The first complete translation of the papyrus was published by Dr. H. Joachim of Berlin in 1890.

According to this translation, the section on ophthalmology seems to end with a "Method of removing fat (Xanthelasma) from the eye; Messerstein in frischer Milch mischen und sehr häufig auf das Auge bringen." Then follow several formulas to be used in case of a bite by a human being. These are followed by this paragraph:

"Zu machen gegen den Biss eines Krokodiles, . . ." to which Joachim has appended the following footnote: "Eigentlich gegen den Krokodilrachen. Ebers, der diesen kleinen abschnitt noch, wie oben erwähnt, zu den Augenkrankheiten rechnet, sieht hierin eine Augenkrankheit, nämlich das Pterygion. Er hat wohl übersehen das oben (Takel 59,1) adet anders determiniert ist als hier und dass oben vor allem von 'adet m mert' die Rede ist; cfr. auch Tafel 59,10." This may be translated as follows: "Ebers considered that this small section belonged to the section on ophthalmology, as was mentioned previously, and believed that this referred to a disease of the eye; namely, pterygium. He evidently overlooked the fact that in plate 59,1, adet was determined as having another meaning and that especially in this section, the question dealt with adet m mert (compare plate 59,10)."

The question seems to simmer down to the rendition of adet. According to Ebers it could refer to pterygium, but his reasoning here is rather weak. Hirschberg translates it as ocular carcinoma, but he himself questions the validity of the rendition. Lüring offers the most logical translation as injury, which seems to fulfil all requirements. If this is accepted, the section in question deals purely and simply with the bite of a crocodile and has nothing to do with diseases of the eye.

TREATMENT OF CARDIAC DECOMPENSATION

To the Editor:—A patient of mine is a 46 year old woman with a badly decompensated cardiac condition, who is being given 1 cc. of salyrgan intravenously once a week. Following the first four injections, marked subjective improvement was noted. Following the last two injections, however, she has had rather abrupt drops in her systolic blood pressure from 200 to 140 or 150 mm. of mercury. Accompanying this drop she has had severe aching, slight febrile reaction and marked weakness. The reaction came on in each case approximately four hours after the injection and persisted until the blood pressure had been elevated to its former level by repeated small injections of epinephrine. Urinalysis reveals a trace of albumin and very occasional hyaline casts. Moderate diuresis has followed each injection. Kindly inform me whether the salyrgan should be stopped. Please omit name.

M.D., West Virginia.

ANSWER.—Reactions from salyrgan in 1 cc. doses are infrequent, particularly when used in patients with edema.

Mercurial diuresis is intimately associated with the available sodium chloride and during mercurial diuresis large quantities of sodium chloride are eliminated in the urine. When salyrgan is used, the sodium chloride reserves of the body often become depleted, particularly if the patient is on a low sodium chloride intake. When this occurs the diuretic effect of the drug is decreased but can oftentimes be enhanced again by giving preliminary doses of sodium chloride. Furthermore, some authors have felt that following sodium chloride depletion in the body further doses of salyrgan may give reactions as a result of hypochloremia.

The question does not state whether preliminary treatment to salyrgan medication was given. This is important, because if salyrgan diuresis is enhanced by other innocuous drugs such as the acid base salts, it is not necessary to give salyrgan as often to obtain the same results. The following regimen is suggested:

The patient is given 4 cc. of a 40 per cent solution of ammonium nitrate three times a day in half a glass of water after eating. Then the salyrgan is given not oftener than every

three days. On the second day after the salyrgan the patient should take a saline cathartic.

If the patient becomes nauseated from the ammonium nitrate, hydrochloric acid 5 per cent can be substituted with good results. The dose commonly used is 4 cc. three times a day in half a glass of water after eating. Ammonium chloride is considered by some preferable to ammonium nitrate.

PREGNANCY IN PATIENT WITH ONE KIDNEY

To the Editor:—I should like your advice on the following problem: A woman, aged 41, has two living children, aged 18 and 20 years. About ten years ago she had one kidney removed following its almost complete destruction as the result of obstruction of the ureter by a stone. In the past three years she has had two or three spontaneous abortions in the early months of pregnancy not apparently associated with any signs of low renal function. She earnestly desires another child. My questions are: 1. Would you advise against any woman with only one kidney becoming pregnant? 2. If so, what results of what kidney function tests would you expect before you advise such a woman that she could successfully withstand the demands made on her organism by a pregnancy? 3. Is it possible that her abortions were the protective acts of nature against a possible damaging of her one kidney?

LEON PARIS, M.D., Bronx, N. Y.

ANSWER.—1. A woman with one perfectly functioning kidney usually stands pregnancy and labor well and therefore, in the absence of other contraindications, may take the slight risk.

2. Of the kidney function tests during pregnancy only one has proved even partly reliable, the urea clearance test, and even this one has to be discounted somewhat since urea clearance is naturally lower during gestation.

3. It is possible that nature throws off an offending parasite (the ovum) by abortion to protect an inadequate renal function. Kidney disease may exist with minimal symptoms and tests may not discover it. Many evidences of this exist in the "latent nephritis" of older authors and "low reserve kidney" of Williams and Stander. Indeed, there are rare cases in which the only evidences of maternal kidney damage are to be found in the fetus and the placenta of the aborted ovum—particularly the placenta.

Have all the other causes of habitual abortion been ruled out in this case?

In this particular patient it is justifiable to let pregnancy supervene if at present no renal inefficiency is discoverable, treat the case as if there were latent nephritis, and watch with exceeding care for the very first manifestations of kidney trouble. This means, most of all, clinical supervision but with aid from the laboratory. In addition to urea clearance tests, nonprotein nitrogen, creatinine and blood concentration readings must be made regularly.

PARAFFIN BATH METHOD FOR ARTHRITIS

To the Editor:—Kindly give details regarding the paraffin bath for rheumatoid arthritis of the interphalangeal joints of the fingers. Kindly omit name.

M.D., Pennsylvania.

ANSWER.—The equipment for treatment by means of hot paraffin dips includes a metal or enamel-ware container which may be of various shapes and sizes, cakes of paraffin, and a heater.

The container may be the ordinary double boiler that is used in cooking cereals. It may be the shape of an electrical sterilizer. It may be the shape of a large coffee pot. It may be like a small clothes boiler used in the laundry.

For the hand and arm, a container shaped like a medium-size electrical sterilizer is filled two-thirds full with paraffin, which can be melted by gas or electric heat. The paraffin comes like cakes of chocolate. The Standard Oil Company puts out a satisfactory product. These cakes are put into the container and heated to the melting point. One may use a thermometer in order to keep the temperature between 118 and 136 F. A simpler method is to keep the heat at the point where it will melt the bulk of the paraffin, but a fresh half cake will remain in solid form at the bottom of the container.

The patient stands or sits and plunges his hand and lower forearm into the hot paraffin and removes it after from ten to thirty seconds. A coating of paraffin adheres to the part. At the end of from thirty to sixty seconds, when the coat is dry, the hand and forearm are again plunged in and another coat is added to the first. This process is repeated at intervals of from thirty to sixty seconds until six or eight coats have been applied.

The hand is then removed, placed on a pillow and remains for a period of from eight to ten minutes. The entire period, from the time the hand is first placed in the paraffin until the entire paraffin glove or gauntlet is removed, should occupy from fifteen to twenty minutes.

MASTODYNIA

To the Editor:—I would welcome therapeutic suggestions in the following case of mastic engorgement: A woman, aged 27, married, with one child, aged 5 years, had an oversupply of milk during the nursing period, and the milk was pumped out of her engorged breasts and fed to other infants. She tries to limit her fluid intake, because immediately after fluids are taken, her breasts undergo enlargement. As she puts it, everything that she drinks runs to her breasts. She has a slight tendency to obesity, but her breasts are out of proportion to the rest of her body, and she feels self conscious. Before the menstrual period the breasts undergo similar hypertrophy. Kindly omit name.

M.D., Massachusetts.

ANSWER.—The engorgement of the breasts in this case most likely is due to some endocrine disturbance. It may be related to the condition of "painful breasts," or mastodynia, which many women experience just before or at the menstrual periods. It occurred to Cutler (THE JOURNAL, April 11, 1931, p. 1201) that the syndrome of "painful breasts" might be associated with diminished follicular function. He has obtained good results with hypodermic injections of estrogenic substance. G. Van S. and O. W. Smith (*Am. J. Physiol.* **103**:356 [Feb.] 1933) showed that large doses of estrogenic substance (e. g., theelin) prevent lactation in rabbits after parturition. This has since been shown by other workers to result from suppression of the anterior pituitary, which secretes the lactogenic principle. In the experiments of the Smiths it was not always possible to inhibit lactation by estrogenic substance after the secretion of milk had continued for some time. Desiccated thyroid may be tried, because it not only inhibits the secretion of milk but also acts as a diuretic. Wachtel (*Zentralbl. f. Gynäk.* **53**:987 [April 20] 1929) successfully used thyroid to diminish the flow of milk in women. Pituitary extract definitely diminishes or stops the flow of milk in animals. Fauvet (*Arch. f. Gynäk.* **155**:100, 1933) succeeded in inhibiting the flow of milk in 121 out of 123 women by administering thyroxine tablets and phenobarbital.

HEREDITY IN HARELIP

To the Editor:—A young couple, both university graduates, have recently consulted me in regard to the possibility of having another child. One year ago they had a baby born with a harelip, although the pregnancy was apparently normal. The question asked me was "In the event of another child, what are the possibilities of a recurrence of harelip or some other anomaly?" The mother has recently been examined by a physician, who suggested a possibility of a hypothyroidism; a basal metabolism test has been arranged for. Is there anything that can be done to assist in the prevention of such an anomaly? Is harelip a recessive or a dominant trait? In view of the chances of a recurrence, is it best to advise those parents to have no more children? Kindly withhold name and address.

M.D., California.

ANSWER.—The available statistics would suggest that there is a hereditary predisposition in something like 30 per cent of the occurring cases of congenital facial clefts. However, if there are no other cases in the family there is probably no more reason to expect other children to be so afflicted than in a family with a negative history of such a deformity. There does not seem to be anything that can be done to assist in the prevention of such an anomaly, although there is a suggestion that some of these cases are associated with extreme vomiting early in pregnancy. In some others the mother gives a history of having had a serious tooth complication early in pregnency, but the relationship of this to the occurrence of harelip is not conclusive. Harelip is a negative and not a positive condition, and there probably are as many causes for it as there might be for a fracture of a leg. There is no apparent reason why the parents should be advised not to have other children. If properly cared for, these children are about as well off as the average.

FRACTURE OF THE OLECRANON

To the Editor:—What is the latest approved method in treating a complete fracture of the olecranon? A advised an open reduction with the elbow maintained in flexion, while B advised closed reduction and extension. Is flexion now the preferred position when the closed reduction is used? Please discuss with regard to functional recovery and length of convalescence. Please omit name.

M.D., New York.

ANSWER.—The treatment of this case depends on several factors, including the degree of separation, occupation of the person, risk of operation, equipment from the standpoint of the hospital and surgical team, and whether the fragments can be perfectly approximated when the elbow is in extension. In fracture of the olecranon, under anesthesia with gas, the arm may be completely extended and the smaller fragment manipulated in line with the larger one. If it can be perfectly approximated, a plaster-of-paris cast may be applied with the elbow in extension for about three weeks. Then the cast is

bivalved so as to apply radiant heat, gentle massage and careful flexing movements twice daily. If the fragments cannot be perfectly approximated, an open operation consisting of approximation of the fragments, four drill holes inserted and the fragments united by living suture, such as fascia lata, may be attempted. In many cases the smaller fragment is only a flake of bone and cannot be drilled sufficiently to permit suturing by this method. In that case, catgut is used.

POSSIBLE EPILEPSY

To the Editor:—A man, aged 58, a lawyer, has spells at night of jerking muscles of the body and legs that wake him up. The condition is severe, as the jerks are violent and they even draw his legs backward; but they do not occur in the daytime, nor have they interfered with his work. But they may keep him awake half the night more or less. His physique is good. He hunts and fishes and is active. The jerks have persisted for several years but they are getting worse and now he seems to get a pressure or pain in his head with the attack. Physically he is well. The urine is normal. He eats properly. He has a good business with a large clientele. He smokes cigarets quite freely. He has used considerable liquor in years past and was addicted to quite a spree now and then but usually was ready for business when needed. He is pleasant and affable, but when the jerking spells seize him he curses and becomes angry; in fact, he is said to have gotten up recently and pounded with his fists; he even threw a glass and broke it. Then he cleaned up the pieces and simply told his wife that he had had a terrible night and dismissed the subject. I have urged him to go to a neurologist and be checked up but so far have not been able to get his consent, so I am writing to you for advice.

M.D., Minnesota.

ANSWER.—Your advice to the patient is eminently sound, as it is obviously essential for a rational therapy that a thorough examination be made, general as well as neurologic. The account given suggests that the seizures are of an epileptic nature, though no guess can be hazarded as to their etiology or significance. The onset of seizures late in life—the date of onset is not given—always suggests an organic basis, which should be discovered if possible. Temporizing is unwise and one would hesitate, if not refuse, to advise any merely symptomatic therapy.

TOXICITY OF DIBUTYL PHTHALATE

To the Editor:—Kindly advise me whether the handling of dibutyl phthalate is in any way injurious to the health of an individual. Is there any connection between the handling of this drug and kidney stones?

JOSEPH L. NORTELL, M.D., Chicago.

ANSWER.—Dibutyl phthalate long has been used as a plasticizer in cellulose nitrate and acetate lacquers and in the manufacture of safety glass. No experience is known to have developed indicating that this substance possesses toxic properties. In free form this phthalate comes in direct contact with the skin of certain classes of glass workers. No skin irritation has been observed. Its high boiling point (340 C.) is unfavorable to the ready formation of vapors. Burke, in an article entitled "Lacquers and Their Hazards" (*New York Bull. Indust. Hyg.*, April, 1932, p. 23), states that phthalate esters may be considered free of health hazards. In the state of Ohio, wherein there is a compulsory system for the reporting of occupational diseases, apparently no cases of dibutyl phthalate poisoning have been recorded. While the total amount of information on the action of this phthalate on the human body is scanty, the stand may be taken that no sound reason exists for the attribution to this agent of the formation of kidney stones.

ESTIMATING BASAL METABOLISM IN PATIENT WITH AMPUTATION

To the Editor:—How can the basal metabolic rate be estimated in a male patient with bilateral midthigh amputation? This patient has a pulse rate of 94 and a blood pressure of 160 systolic, 94 diastolic. Can the increased pulse rate and elevated blood pressure be attributed to the amputation, assuming that the general physical examination is negative.

M. I. MENDELOFF, M.D., Charleston, W. Va.

ANSWER.—Aub and Du Bois (Clinical Calorimetry, *Arch. Int. Med.* **19**:840 [May, part 2] 1917) discuss the basal metabolism of dwarfs and legless men. They conclude that "the law of surface area holds good for men of unusual body shape." Based on this authoritative statement, which has never been disputed, calculations in this case are the same as in any other individual. One would therefore proceed as in the following sample calculation in an "assumed" case with a bilateral midthigh amputation: Mr. X, aged 43, height 105 cm., weight 58.8 Kg., body surface 1.19 square meters, total calories per hour determined by basal metabolism test 51.7, or 43.3 calories per square meter of body surface. The predicted normal (Aub-Du Bois) in this case is 38.5 calories for each square meter per hour. This represents, in this assumed case, a basal metabolic rate of +13. The body surface is conveniently obtained by the use of the well known nomographic body surface chart of Boothby and Sandiford (Du Bois: Basal Metabolism in Health and Disease, edition 2, p. 120; also table 29, p. 169). It is quite evident that in the application of the body surface formula the loss of weight by amputation compensates to some extent for the reduction, if any, in body height even in a one legged subject.

One of the legless men discussed by Aub and Du Bois (p. 848) had a blood pressure of 188 systolic, 130 diastolic. This hypertension, however, can be accounted for by the other clinical observations reported. Although data on this point are not obtainable at present, a normal blood pressure should be expected in a normal individual after full recovery from the amputation.

PALPITATION AND NERVOUSNESS AFTER PROCAINE AND EPINEPHRINE

To the Editor:—It has come to my attention that occasionally, after the injection of a local anesthetic solution such as procaine combined with epinephrine, the patient complains of palpitation and nervousness. Kindly outline the anatomic course of the impulse generated by the vasoconstriction at the site of the injection (for example, an injection surrounding the tonsil) to the structures involved in producing the subjective symptoms of palpitation. Do you know of any method of preventing these symptoms from developing in sensitive patients?

H. C. SCHOLER, M.D., Detroit.

ANSWER.—These are not uncommon symptoms following such injections. Unfortunately, a general satisfactory explanation cannot be offered. The palpitation of nervousness following injections of procaine solution containing epinephrine is not due to a reflex generated at the site of vasoconstriction but probably to the following factors:

1. Anxiety and fear of operation in highly nervous individuals, which will induce palpitation and this, in turn, more nervousness.

2. A too rapid entrance into the circulation of some of the epinephrine and procaine from the site of injection.

3. The possibility that at the time of injection the point of the needle may empty directly into a small vein and hence a fairly large quantity of the substance enter the general circulation rather rapidly.

4. Hypersusceptibility of some individuals to both epinephrine and procaine and its allies. Patients with hyperthyroidism, many women at the menopause, persons with hypertension, and those with neurocirculatory asthenia are said to be highly susceptible to epinephrine. All the commonly used local anesthetics have caused such untoward symptoms, which have been attributed to idiosyncrasy or hypersusceptibility.

There is a possibility that these symptoms may be prevented by the preliminary administration of a sedative such as barbital, about 0.3 Gm. (5 grains) by mouth, half an hour before the local injection is made. Secondly, all injections should be made rather slowly precautions being taken to avoid the possibility of direct entrance of the needle into a vein. With slow injection the operator may better detect an idiosyncrasy to the drugs.

PARALYSIS OF CONVERGENCE OF EYES

To the Editor:—A man, aged 23, presents a negative medical history until six months ago, when he began to get attacks of a "feeling of uncertainty" about him and his eyes "just seemed to gaze into space." He was examined several times but nothing seems to have been found. Refraction gave no relief. Recently, I examined the patient; the only significant observations were in the eyes. The left pupil is slightly larger than the right. Both react to light but only feebly in accommodation. The eyegrounds are normal. The patient is able to move his eyes in all directions freely but is unable to converge them. Convergence seems to be less on the left side. There is no nystagmus or squint. This appears to be more than on ordinary exophoria. The Wassermann reaction is negative. Urinalysis is negative. The visual fields are not altered. What diagnosis does this suggest? Is there any relation between the weakness of the left interior and the dilatation of the pupil? Where is the lesion? Is there any treatment?

M.D., Pennsylvania.

ANSWER.—The one missing point in the enumeration of symptoms is whether diplopia exists or can be elicited and whether such diplopia is for distance or for near. The recital indicates a paresis of convergence, which is not at all uncommon. True paralysis of convergence, according to Bielschowsky, does not exist, whereas a weakness or paresis of convergence is a well recognized clinical entity. This is, of course, in direct connection with the lack of convergence reaction of the pupil, as the centers of convergence and of pupillary contraction to convergence or accommodation are side by side and are stimulated simultaneously. These centers are in close asso-

ciation with the third nucleus but anatomically are probably located in the occipital cortex. The most common cause of this trouble is epidemic (lethargic) encephalitis, although other cortical lesions must be taken into consideration. The treatment must be based on the underlying cause.

LIQUID FACE POWDER

To the Editor:—Have you a formula for a liquid suspension powder, which is known in the cosmetic trade as a liquid face powder? Could something like this be used as a medium for pigments to be applied over disfiguring marks on the face or arms? I mention this type of preparation because of the fact that it covers better and seems to cling to the skin better than the dry powder dusted or rubbed on. Kindly omit name.

M.D., Minnesota.

ANSWER.—Calamine lotion, composed of calamine powder, a pink crude zinc carbonate, and zinc oxide in lime water is such a so-called liquid powder. Any suitable inert insoluble powder can be used. If used on dry skin, equal parts of lime water and rose water will probably be more agreeable. A small amount of glycerin may be added if this combination is too drying.

Zinc paste composed of 25 per cent of zinc oxide, 25 per cent of starch and petrolatum or ointment of rose water 50 per cent is another good covering preparation.

IONIZATION OF NASAL MUCOSA

To the Editor:—Have you any data concerning the origin of the fad for ionization of the nasal mucosa, which is so extensively exploited at the present time? My own information is to the effect that it was initiated by an electrical engineer in San Antonio, Texas, who sold the idea to the present manufacturers.

CHARLES H. EVERMANN, M.D., St. Louis.

ANSWER.—It is difficult to state absolutely the origin of the employment of ionization of the nasal mucous membrane. There is herewith submitted a list of references beginning in 1917 and ending with a recent paper by Dr. Harold L. Warwick in the March issue of the *Laryngoscope:*

Kesteven, L.: Notes on Ionic Medication and the Method of Administration, *Brit. M. J.* **2:** 423 (Sept. 29) 1917. This article contains a brief paragraph on the reduction of enlarged turbinates.

Kesteven, L.: Ionic Medication in Diseases of the Ear, Throat and Nose, *Therap. Gaz.* **42:** 613 (Sept.) 1918.

Friel, A. R.: Treatment of Sepsis in Nose and Ear by Ionization, *Practitioner* **103:** 449 (Dec.) 1919.

Friel, A. R.: Zinc Ionization and Zinc Electrolysis in Diseases of Throat, Nose and Ear, *Dublin J. M. Sc.*, February 1922, p. 640.

Pradhan, K. N.: Electric Ionization and Nose Operations, *Indian M. Gaz.* **57:** 137 (April) 1922.

Warwick, H. L.: Treatment of Hay Fever and Its Allied Conditions by Ionization, *Laryngoscope* **44:** 173 (March) 1934.

TREATMENT OF OLECRANON BURSITIS

To the Editor:—I am treating a healthy man, aged 53, for an olecranon bursitis, which followed a bruising of the left elbow on his car door a month ago. Hot applications, rest and light bandaging have failed to cure it. Under strict asepsis I have aspirated it twice, but it soons fills up again. The fluid obtained is a clear straw color tinged with blood. Would injection with some sclerosing solution cure it? Would such an injection affect the elbow joint in any way? What type of solution would you recommend should you deem this treatment advisable?

DONALD B. KNOWLES, M.D., Chicago.

ANSWER.—Injection with a sclerosing solution might effect a cure. One must be careful that there is no connection between the joint capsule and the bursal sac. The most commonly used preparations for injection are camphor and phenol, compound solution of iodine and Pregl's solution of iodine. Some cases of olecranon bursitis do not clear up until foci of infection are removed, the most common being in the intestinal tract. Scarification of the bursal sac walls or excision may be necessary.

INCOMPATIBILITY OF ACETYLSALICYLIC ACID (ASPIRIN) AND SODIUM BICARBONATE

To the Editor:—I have had several minor arguments with several confrères about combining acetylsalicylic acid (aspirin) and sodium bicarbonate. I have always felt that, since one is an alkali and the other an acid, combining them in the same prescription is incompatible. Will you please tell whether or not they may properly be combined? If so, what are the advantages? If not, what are the disadvantages, other than mixing any acid with an alkali? Please omit name.

M.D., Pennsylvania.

ANSWER.—The alkali decomposes the acetylsalicylic acid into acetic and salicylic acids. Hence the incompatibility is worse than merely any mixture of acid and alkali. There are no advantages in this mixture.

HONEY IN DIABETES

To the Editor:—Would you please advise whether honey is permissible in diabetes? If so, what quantity? If not, what form of sweets can be given? Please omit name.

M.D., Arkansas.

ANSWER.—That diabetic patients can tolerate honey better than other sweets has been reported at various times. However, the sugars in honey, including levulose, are not oxidized in complete diabetes, and this being true it is unlikely that the patient with mild diabetes is injured any less by honey than he would be by dextrose. Gluside sweetens without adding either sugar or calories to foods, and in divided doses not exceeding 4 or 5 grains (0.26 or 0.32 Gm.) daily it appears to be harmless. Further details are given in Joslin's Manual for Diabetic Patients, ed. 5, Philadelphia, Lea & Febiger, 1933, or Wilder's Primer for Diabetic Patients, ed. 5, Philadelphia, W. B. Saunders Company, 1934.

PIPERAZINE FOR RENAL CALCULI

To the Editor:—Please inform me whether piperazine is of any value in dissolving renal calculi. Will its continued use cause any damage to the kidneys or other organs? Please omit name.

M.D., North Carolina.

ANSWER.—Piperazine is of no value in dissolving renal calculi. It does not dissolve uric acid in the presence of sodium salts any better than any other alkali and, as part of it is oxidized in the system, its effect on the alkalinity of the urine and therefore its solvent power is less than that of sodium bicarbonate. It is virtually nontoxic.

NATURE OF INFECTIOUS DISEASE

To the Editor:—Is there any disease which may be contracted a number of times and in which each succeeding exacerbation is less severe and also in which finally immunity is established?

STANLEY M. GATES, M.D., Monticello, Ark.

ANSWER.—Tularemia and undulant fever appear to be good examples of the kind of infectious disease indicated in the question.

TRYPARSAMIDE IN SYPHILIS OF THE OPTIC NERVE

To the Editor: In "Queries and Minor Notes," August 11, appears a question from Dr. W. W. Pike of Binghamton, N. Y., on the use of tryparsamide in syphilis of the optic nerve. The answer to this query betrays unfamiliarity with the recent literature.

1. In part 1 of Dr. Pike's query, he himself is in error in stating that Woods and Moore have shown improvement with tryparsamide in cases of optic atrophy. On the contrary, Woods and myself have definitely advised against the use of this drug in optic atrophy, and the authors to whom Dr. Pike has reference are probably Cady and Alvis (THE JOURNAL, Jan. 16, 1926, p. 184). On the basis of my own experience with Woods, I am therefore diametrically opposed to the answer to part 1 of this query and, in my opinion, it would be most unwise to use tryparsamide.

2. In response to the question "What is the present status of the Swift-Ellis treatment in the treatment of . . . optic atrophy?" the answer is given "There is no known treatment which can cure optic syphilitic atrophy [sic]. While it is true that no known form of treatment will "cure" syphilitic optic atrophy, its progress can be arrested in about 50 per cent of the cases treated (provided vision in the better eye is 20/40 or more) by the use of subdural treatment. The literature on this point is summed up in an article "The Syphilitic Optic Atrophies" (*Medicine* **11:** 263 [Sept.] 1932) and is more briefly summarized in chapter XXIII of my recent monograph "The Modern Treatment of Syphilis," Springfield, Ill., Charles C. Thomas.

3. To the question "Have any benefits been observed from the use of fever therapy in arresting optic atrophy?" the answer is an unequivocal "No." This answer is quite untrue. Definite arrest of the progress of syphilitic optic atrophy in many cases has resulted from the use of malaria.

4. To the question "Is there any other treatment that you could suggest to arrest advancing impairment of vision and perhaps restore sight?" the answer is again "No." As a matter of fact, in the particular case described by Dr. Pike the atrophy is apparently largely unilateral with normal fields and fundi in the right eye. The prognosis from either subdural or fever treatment in cases of this type is an extremely favorable one.

5. The benefits derived from malarial therapy are not thought by most observers to be mainly due to the rise of temperature and its persistence. References to this point may be found in chapter XXV of my own monograph and in many other papers, prominent among which are

Bruetsch, W. L.: Activation of the Mesenchyme with Therapeutic Malaria, *J. Nerv. & Ment. Dis.* **76:** 209 (Sept.) 1932.

Bruetsch, W. L.: Histopathology of Therapeutic (Tertian) Malaria, *Am. J. Psychiat.* **12:** 19 (July) 1932.

Freeman, Walter: Malaria Treatment of Paresis, *Am. J. Syph.* **14:** 326 (July) 1930.

Freeman, Walter; Fong, T. C., and Rosenberg, S. J.: The Diathermy Treatment of Dementia Paralytica, THE JOURNAL, June 3, 1933, p. 1749.

J. E. MOORE, M.D., Baltimore.

Council on Medical Education and Hospitals

COMING EXAMINATIONS

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: *Written (Group B candidates).* The examination will be held in various centers throughout the country, Oct. 1. *Oral (Group A and Group B candidates).* San Antonio, Texas, Nov. 13-16. Sec., Dr. C. Guy Lane, 416 Marlborough St., Boston.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Written (Group B candidates).* The examination will be held in various cities of the United States and Canada, Nov. 3. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh.

AMERICAN BOARD OF OPHTHALMOLOGY: San Antonio, Texas, Nov. 13; Philadelphia, June 10. *Application must be filed at least sixty days prior to date of examination.* Sec., Dr. William H. Wilder, 122 S. Michigan Blvd., Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY: San Antonio, Texas, Nov. 16. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

ARIZONA: Phoenix, Oct. 2-3. Sec., Dr. J. H. Patterson, 320 Security Bldg., Phoenix.

CALIFORNIA: Sacramento, Oct. 15-18. Sec., Dr. Charles B. Pinkham, 420 State Office Bldg., Sacramento.

COLORADO: Denver, Oct. 2. Sec., Dr. Wm. Whitridge Williams, 422 State Office Bldg., Denver.

CONNECTICUT: *Basic Science.* New Haven, Oct. 13. *Prerequisite to license examination.* Address, State Board of Healing Arts, 1895 Yale Station, New Haven.

GEORGIA: Atlanta, Oct. 9-10. Joint Secretary, State Examining Boards, Mr. R. C. Coleman, 111 State Capitol, Atlanta.

IDAHO: Boise, Oct. 2. Commissioner of Law Enforcement, Hon. Emmitt Pfost, 205 State House, Boise.

ILLINOIS: Chicago, Oct. 16-18. Superintendent of Registration, Department of Registration and Education, Mr. Eugene R. Schwartz, Springfield.

IOWA: Des Moines, Oct. 8-10. Dir., Division of Licensure and Registration, Mr. H. W. Grefe, Capitol Bldg., Des Moines.

MICHIGAN: Lansing, Oct. 9-11. Sec., Board of Registration in Medicine, Dr. J. Earl McIntyre, 202-3-4 Hollister Bldg., Lansing.

MINNESOTA: *Basic Science.* Minneapolis, Oct. 2-3. Sec., Dr. J. Charnley McKinley, 126 Millard Hall, University of Minnesota, Minneapolis. *Medical.* Minneapolis, Oct. 16-18. Sec., Dr. E. J. Engberg, 350 St. Peter St., St. Paul.

MISSOURI: Kansas City, Oct. 24. State Health Commissioner, Dr. E. T. McGaugh, State Capitol Bldg., Jefferson City.

MONTANA: Helena, Oct. 2. Sec., Dr. S. A. Cooney, 7 W. 6th Ave., Helena.

NEBRASKA: *Basic Science.* Lincoln, Oct. 2-3. Dir., Bureau of Examining Boards, Mrs. Clark Perkins, State House, Lincoln.

NEW JERSEY: Trenton, Oct. 16-17. Sec., Dr. James J. McGuire, 28 W. State St., Trenton.

NEW MEXICO: Santa Fe, Oct. 8-9. Sec., Dr. P. G. Cornish Jr., 221 W. Central Ave., Albuquerque.

NEW YORK: Albany, Buffalo, Syracuse and New York, Sept. 24-27. Chief, Professional Examinations Bureau, Mr. Herbert J. Hamilton, Room 315 Education Bldg., Albany.

RHODE ISLAND: Providence, Oct. 4-5. Dir., Public Health Commission, Dr. Lester A. Round, 319 State Office Bldg., Providence.

WISCONSIN: *Basic Science.* Madison, Sept. 22. Sec., Prof. Robert N. Bauer, 3414 W. Wisconsin Ave., Milwaukee.

WYOMING: Cheyenne, Oct. 1. Sec., Dr. W. H. Hassed, Capitol Bldg., Cheyenne.

Utah July Report

Mr. S. W. Golding, director, Department of Registration, reports the written examination held in Salt Lake City, June 27-29, 1934. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. Twenty candidates were examined, all of whom passed. Twelve physicians were licensed by reciprocity. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Northwestern University Medical School		(1934)	81, 85.7, 86.5, 86.8,* 87.1,* 87.3
Rush Medical College		(1934)	82.2, 83.4,* 83.6
University of Louisville School of Medicine		(1934)	86.3†
Harvard University Medical School		(1933)	89.4
Wayne University College of Medicine		(1934)	85.3
Creighton University School of Medicine		(1933)	80.8, 84.8
University of Nebraska College of Medicine		(1933)	83.7, (1934) 82.7†
University of Pennsylvania School of Medicine		(1931) (1933) 79.4, 85.2, 85.4	88.1,

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Stanford University School of Medicine		(1933)	California
University of Colorado School of Medicine		(1932)	Missouri
Northwestern University Medical School		(1933) (1934)	Illinois, Minnesota
Rush Medical College		(1933)	Illinois, 2, Michigan
State University of Iowa College of Medicine		(1931)	Iowa
University of Louisville School of Medicine		(1932)	Kentucky
University of Nebraska College of Medicine		(1925)	Nebraska
Jefferson Medical College of Philadelphia		(1933)	California

* This applicant has completed his medical course and will receive his M.D. degree and Utah license on completion of internship.
† License withheld pending completion of internship.

Kentucky June Report

Dr. A. T. McCormack, secretary, State Board of Health, reports the written examination held in Louisville, June 6-8, 1934. The examination covered 11 subjects and included 110 questions. An average of 70 per cent was required to pass. Seventy-four candidates were examined, 73 of whom passed and 1 failed. Six physicians were licensed by reciprocity. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
University of Louisville School of Medicine		(1932)	86, 88, (1933) 79, 83, 85, (1934) 79, 79, 79, 79, 79, 80, 80, 80, 81, 81, 81, 81, 81, 81, 81, 81, 81, 81, 81, 81, 82, 82, 82, 82, 82, 82, 82, 82, 82, 83, 83, 83, 83, 83, 83, 83, 84, 84, 84, 84, 84, 84, 84, 84, 84, 85, 85, 85, 85, 85, 85, 85, 85, 85, 85, 86, 86, 87, 87, 87, 87, 88, 88, 88, 89, 90, 91
University of Cincinnati College of Medicine		(1934)	82*
Temple University School of Medicine		(1933)	81
University of Tennessee College of Medicine		(1934)	77, 81

School	FAILED	Year Grad.	Per Cent
Memphis Hospital Medical College		(1904)	52

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Stanford University School of Medicine		(1932)	California
Emory University School of Medicine		(1930)	Georgia
University of Michigan Medical School		(1933)	Michigan
University of Cincinnati College of Medicine		(1927)	Ohio
Vanderbilt University School of Medicine		(1928), (1930)	Tennessee

* This applicant has received an M.B. degree and will receive an M.D. degree on completion of internship.

Alabama July Examination

Dr. J. N. Baker, secretary, Alabama State Board of Medical Examiners, reports the written examination held in Montgomery, July 10-13, 1934. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. Eleven candidates were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Emory University School of Medicine		(1934)	88.8
Rush Medical College		(1934)	90
Louisiana State University Medical Center		(1934)	85.9
Tulane University of Louisiana School of Medicine		(1933) (1934) 86, 87.3, 89.1, 89.8	86.8,
Harvard University Medical School		(1932)	89.6
University of Tennessee College of Medicine		(1934)	82
Osteopath			83.7

Seventeen physicians were licensed by reciprocity from January 15 to July 6. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Univ. of Arkansas School of Medicine		(1930)	La., (1933) Arkansas
Rush Medical College		(1931)	Indiana
College of Physicians and Surgeons of Chicago		(1911)	Illinois
Louisiana State University Medical Center		(1934)	Louisiana
Tulane Univ. of Louisiana School of Medicine		(1931), (1933)	Louisiana
Johns Hopkins University School of Medicine		(1904)	Tennessee
University of Pennsylvania School of Medicine		(1931) (1932)	N. Carolina, D. C.
University of Tennessee College of Medicine		(1932, 2) (1933)	Tennessee, Mississippi
Vanderbilt Univ. School of Med.		(1926), (1929), (1931)	Tennessee
University of Virginia Department of Medicine		(1931)	Virginia

District of Columbia July Examination

Dr. W. C. Fowler, secretary, Commission on Licensure, reports the written examination held in Washington, July 9-10, 1934. The examination covered 6 subjects and included 58 questions. An average of 75 per cent was required to pass. Thirty-three candidates were examined, 32 of whom passed and 1 failed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
George Washington University School of Medicine		(1931)	85, 86.5, (1932) 84.9, (1933) 83.4, 84.4, 84.6, 85.6, 86, 86.9, 87.2
Georgetown University School of Medicine		(1932) (1933) 82.4, 83, 83.5, 83.5, 84.3, 85.4	82.5,
Howard University School of Medicine		(1932) (1933) 82	81.9, 82.5,
State University of Iowa College of Medicine		(1926)	81.5
Tulane University of Louisiana School of Medicine		(1933)	86.2
Johns Hopkins University School of Medicine		(1926) (1927) 83.8, (1929) 85.2, (1932) 85.3	92.5,
University of Nebraska College of Medicine		(1933)	89.4
New York Univ., Univ. and Bellevue Hosp. Med. Col.		(1931)	79.4
Jefferson Medical College of Philadelphia		(1926)	88.8
University of Nashville Medical Department		(1905)	85
Medical College of Virginia		(1930)	86.6
University of Virginia Department of Medicine		(1925)	81.6

School	FAILED	Year Grad.	Per Cent
Georgetown University School of Medicine		(1932)	71

Book Notices

Foreign Body in Air and Food Passages Roentgenologically Considered. By Chevalier Jackson, M.D., Sc.D., LL.D., Professor of Bronchoscopy and Esophagoscopy, Temple University, and Chevalier L. Jackson, M.D., M.Sc., F.A.C.S., Professor of Clinical Bronchoscopy, Temple University, Philadelphia. Volume XVI, Annals of Roentgenology: A Series of Monographic Atlases. Edited by James T. Case, M.D., Professor of Roentgenology, Northwestern University Medical School, Chicago. Cloth. Price, $12. Pp. 265, with 145 illustrations. New York: Paul B. Hoeber, Inc., 1934.

The material in this excellent monograph is selected from 3,000 cases in the authors' own experience and is representative of practically every form of pathologic change resulting from or complicating a foreign body. The book covers the subject from the clinical point of view and its brief but ample text, numbered by paragraphs, is well illustrated by 145 roentgenograms. Great stress is laid on systematic roentgen studies, and the routine procedure for all cases is clearly mapped out. Repeated exposures are recommended in doubtful cases and overexposures when superimposed pathologic change obscures the foreign body. Preexisting pathologic change together with that produced by the foreign body is properly evaluated through roentgenographic studies, and every effort is made to learn the exact condition of the host as well as the type and location of the foreign body before the latter is removed. Certain definite axioms, the fruit of the authors' wide experience, with illustrative cases are clearly set forth in fourteen paragraphs. These bear on diagnosis in general and point out various complicating factors that may interfere with a proper diagnosis. An excellent chapter on biplane fluoroscopy should be well received by many who have read of this procedure but have not fully understood its details. The authors have been successful in removing 98 per cent of all foreign bodies. Such a high achievement was made possible only through the most meticulous attention to details and the closest cooperation between bronchoscopist and roentgenologist.

Les prématurés. I.—Physiologie du prématuré. Par H. Vignes, professeur agrégé à la Faculté de médecine de Paris. II.—Étude clinique et thérapeutique. Par G. Blechmann. Paper. Price, 20 francs. Pp. 163, with 40 illustrations. Paris: Masson & Cie, 1933.

The first part of this book is in the form of lectures given at the Hospital of Charity, Paris, by Henri Vignes. These lectures are in effect a summarization of important books and studies in the field of pediatrics. The first chapter discusses the underdevelopment of the various organs of premature infants and indicates clearly why one three months under term cannot be raised, even under ideal extra-uterine conditions. Several graphs are included in the first chapter showing the intra-uterine growth in weight, the proportional increase in body height and the measurement of organs, the surface or area of the premature infant relative to weight, and other items. A table is presented showing the term and weight of several abnormally small premature infants observed by various pediatricians. The author emphasizes three circumstances that tend to aggravate the risks of immaturity; namely, obstetric injuries, intra-uterine conditions and hereditary diseases. The second chapter describes the potentiality of the various organs of premature infants for adaptation to extra-uterine life. Although prematurity is the most important cause of infant mortality and a high percentage of infants born prematurely cannot be saved, the author concludes that the premature infant has great potentiality of adaptation to extra-uterine life provided it is protected from exposure to cold, infectious diseases and gastro-intestinal disturbances. Emphasis is placed on the fact that the premature child has need for adequate nourishment, not only for the sake of growth, but also to produce heat, because his small body surface radiates proportionally much more heat than the full-term infant. The latter part of the book discusses the immediate effects of prematurity on a child and enumerates the various imperfections and retardations manifest during the first two or three years of life.

After indicating the distinction between the premature infant (born before term) and the infant with congenital weakness (born before or at term), the author presents in the second part a study of the cardinal characteristics of congenitally weak infants. A classification is made of the different grades of prematurity, and the imperfections to be found in the various organs of such infants, as well as the complications of prematurity, such as sclerema, edema, infection and rickets, are studied. The elements of favorable and unfavorable prognosis are given, and mention is made of exceptions, as cited by Variot, Lambinoy and others. A premature infant whose weakness does not have a pathologic origin and who quickly gains in weight ordinarily develops into a normal child; among other premature infants, the development is not always normal. The author treats in a complete manner the different methods of feeding premature infants and cites the methods of certain foreign pediatricians. This is followed by a study of the hygiene of premature infants, the use of stimulants, methods of maintaining body temperature, and the therapeutics of the important diseases of the premature infant.

Geschlechtsentstehung und willkürliche Geschlechtsbestimmung. Von Dr. E. Kramer. Paper. Pp. 40. Berlin & Leipzig: Deutsches Verlagshaus Bong & Co., 1934.

The pamphlet begins with a brief review and criticism of various antiquated ideas and erroneous popular beliefs regarding a possible control of the sex of human offspring. This introduction is followed by a rather lengthy exposition of the chromosome theory of sex determination. The assumption is then made that since there exists, in all vertebrate species studied, a more or less substantial deviation from the 50:50 sex ratio expected according to the sex chromosome theory, the process of sex determination must involve the working of an additional modifying factor, which, when identified, may prove exceedingly valuable to man in his effort to control the sex of his progeny. On the basis of the works of Bluhm (1924) and Unterberger (1930 and 1932) the author concludes that such a modifying influence, at least in man, is exerted by the differential p_H toleration of the X and Y sperms. The slightly acid reaction given by the secretions of the human vagina and serving to protect the female genital tract from invasion of pathogenic bacteria offers a medium tolerated, within certain time limits, by both X and Y sperms. When, however, the acidity of the vaginal secretions is too high, the vitality of both varieties of sperm may be impaired to such an extent that sterility results. Unterberger, a Königsberg gynecologist, successfully combated this type of sterility by recommending an alkalization of the vaginal tract, before coitus, with an aqueous solution (strength not indicated) of sodium bicarbonate. The results of this treatment were both striking and instructive: quite unexpectedly, in all cases thus treated, only boys were born. Alkalization of the vaginal secretion apparently acted depressingly on the X sperm, so that only the Y spermatozoa were able to reach the oviduct and fertilize the ovum. With this idea in mind, Unterberger proceeded to advise the same manipulation to normal married women who expressed the desire of "having a boy." Again the offspring reported were invariably of the male sex. In later practice this worker simplified the technic of vaginal alkalization by instructing the husband to powder the glans penis, immediately preceding coitus, with dry sodium bicarbonate. This modification likewise proved to be effective. Thus far seventy-four cases, all with positive results, have been reported by Unterberger. All attempts, however, to influence experimentally sex determination in the female direction have as yet been unsuccessful. Similarly ineffective were endeavors to influence, in either male or female direction, the sex of the offspring in lower mammals. In most of the latter the secretions of the vaginal mucous membrane always give an alkaline reaction, and neither their further alkalization nor acidulation brought the expected results. In spite of these failures, which lead one to wonder whether the entire "discovery" is based on sound and fundamental biologic principles, the overenthusiastic author hastens to proclaim it as the beginning of a new era. He seeks, moreover, to explain such phenomena of human reproduction as the fluctuation in the sex ratio of the offspring from copulations at various periods of the menstrual cycle or in relation to the age of the mother, also on the basis of changes in the p_H of vaginal secretion.

The booklet is written in a popular style and is apparently intended for the public. This practice of communicating directly

to the general public, as facts, matters which are still far from being substantiated and which still require extensive experimentation and rigid testing by qualified physiologists and clinicians, is objectionable and must be condemned. To the medical profession, however, the ideas expressed in the paper under discussion should serve as a challenge. The cooperation of men and women in medical practice will no doubt result, within a reasonably short time, in the accumulation of sufficient statistical data to confirm or disprove the effectiveness of the procedure suggested by Unterberger and approved by Kramer for artificial sex determination in the male direction, particularly since the operation involved is simple and harmless. It must, however, be made frankly clear to the intelligent layman whose interest is enlisted for this purpose that he is dealing here with an experiment and not with a new conquest which bears the "tested and approved" seal of science.

Urinary Analysis and Diagnosis by Microscopical and Chemical Examination. By Louis Heltzmann, M.D. With a chapter on the Determination of the Functional Efficiency of the Kidneys. By Walter T. Dannreuther, M.D., F.A.C.S., Professor of Gynecology and Director of Department, New York Post-Graduate Medical School and Hospital, Columbia University. Sixth edition. Cloth. Price, $5. Pp. 385, with 131 illustrations. Baltimore: William Wood & Company, 1934.

This edition embodies extensive changes and additions. New chemical tests have been added, but the author has given only those examinations which can be performed by the technician or physician without the necessity of a complete chemical laboratory. The author stresses the great value of microscopic examination of the urine, when carefully conducted. He gives many original illustrations of the different epithelial cells found in the urine and emphasizes their value in the diagnosis of diseases of the genito-urinary tract. A small drop of thick urinary sediment evenly spread out under a cover glass and examined with the high power (at least 400 to 500 ×) is essential for a satisfactory examination. There are chapters in part I on the histology and secretion of the kidneys, chemical examinations for organic and inorganic substances, proteins, carbohydrates and abnormal constituents. Part II contains microscopic examination and includes crystalline and amorphous sediments, cellular elements, mucus, connective tissue, casts, micro-organisms and parasites. Part III contains microscopic urinary diagnosis, with chapters on diseases of the kidney and its pelvis, diseases of the bladder, and diseases of the generative organs. A chapter on tests of renal function and one on the hormone tests for pregnancy complete the volume. There are numerous illustrations. This book can be recommended as one of the most complete works on urinary analysis.

Leitfaden der Pathologie und Therapie der Kampfgaserkrankungen. Von Dr. med. Otto Muntsch, Oberstabsarzt im Reichsheere, Mitglied des Fr. Landesgesundheitsrates. Second edition. Boards, 9.60 marks. Pp. 110, with 33 illustrations. Leipzig: Georg Thieme, 1934.

It is presumed that during the next period of major warfare large groups of the civilian population may be subjected to the action of war gases. This prospect has prompted the author to seek the cooperation of Red Cross units throughout the world in the collection and appraisal of all possible information bearing on the prevention and treatment of injuries resulting from exposure to these toxic chemicals. The author states, in substance, "with this point in mind the purpose of this book is to offer such knowledge as has been gathered from the different parts of the world as to ways and means for protecting the civilian population against the ravages of war gases." In the several chapters are discussed such topics as the development of chemical warfare; the statistics derived from the late war; the general toxicology and classification of chemical fighting materials; the chemistry of the principal war gases; the special pathology and treatment of such war gases as phosgene, chlorpicrine, dichlordiethylsulphite, lewisite, arsine, the oxides of nitrogen, and carbon monoxide. One of the most attractive features of this book are the numerous illustrations in color, presenting the clinical appearance of various types of disorders following exposure to war gas. In addition, various illustrations in black and white and in color present the results of animal experimentation and the appearance of various organs at necropsy. At present this book holds only limited value in the practice of medicine. Against the day when thousands of persons may be attacked through the medium of gas warfare it contains all the substantial information available to the best known means of preventing the malaction of war gases and the diagnostic treatment of these conditions when produced, together with extensive discussion as to the prospective effects following in the wake of acute damage after exposure to gas warfare materials.

Frakturen und Luxationen: Ein Leitfaden für den Studenten und den praktischen Arzt. Von Professor Dr. Georg Magnus, leitender Arzt der chirurgischen Abtellung des Krankenhauses Bergmannshell in Bochum. Second edition. Paper. Price, 3.60 marks. Pp. 86, with 43 illustrations. Berlin: Julius Springer, 1933.

The first edition of Professor Magnus's primer on fractures and dislocations appeared in 1925. This edition is no larger than the original. The book is offered as a help for students and general practitioners. It is not meant for surgeons. The material is divided into two parts: general and special. General considerations of fractures, as classification, mechanism, clinical picture, methods of examination and diagnosis, associated injuries, healing and interference with healing and general considerations of the handling of fractures occupy twenty-four pages. General considerations of dislocations are covered in five pages. The second—the special—part devotes six pages to fractures of the skull and head and five pages to the trunk, leaving forty-four pages for presentation of fractures and dislocations of the extremities. The author takes up his subject in the most elementary manner, and there is nothing new in what he has to offer. Any first class single volume on surgery presents the subject at least as well, if not better. It is difficult to understand the need for such a volume. The illustrations are equally simple. The enterprise seems hardly worthy of a university professor, and there is nothing in the little volume to interest American physicians.

Contribution à l'étude radiographique du sein normal et pathologique. Par le Dr. Alexandre Espaillat-G. de la Faculté de médecine de Paris. Travail de la clinique chirurgicale du Professeur Gosset et du laboratoire de radiologie clinique de la Faculté (Dr. Ledoux-Lebard, chargé de cours). Paper. Pp. 154, with 18 illustrations. Paris: Librairie Louis Arnette, 1933.

A brief review of the anatomy and histology of the breast is followed by a description of the various physiologic and pathologic changes which this organ may undergo. A careful description is given of the various benign lesions and their differentiation from malignant changes. Based on these anatomic, physiologic and pathologic considerations, the roentgenologic aspects of the mammary gland are thoroughly discussed and the utility of the roentgen study is evaluated. Forty-one cases are reported in detail by way of exemplifying the text. The author believes that the roentgen examination of the breast is of practical utility if carried out with sufficiently rigorous technic. Before attempting the interpretation of the pathologic lesions, the physician must become familiar with the aspects of the normal breast with its various physiologic alterations corresponding to the state of repose, of activity and of atrophy of the gland. Due credit is given to the American investigators for their priority in this work.

Medicine in Canada. By William Boyman Howell, M.D., Anaesthetist-in-Charge, Royal Victoria Hospital, Montreal. IX, Clio Medica: A Series of Primers on the History of Medicine. Edited by E. B. Krumbhaar, M.D. Cloth. Price, $1.50. Pp. 137, with 6 illustrations. New York: Paul B. Hoeber, Inc., 1933.

The author purposely gives a "relatively large amount of space to biographies of pioneer medical men" in order to "show not only the conditions under which medicine was practiced, but the relation of the practitioner to the community as well." The rise of the various prominent hospitals and medical schools is sketched from their humble beginnings in Quebec, Montreal and Toronto, and short chapters are devoted to James Douglas, John Christian Schultz, Archibald Menzies, William T. Tolmie and John Sebastian Helmcken. The meagerness of preparation for the practice of medicine of the early physicians, the hardships endured by most of them in their contentions with the elements, hostile Indians and epidemic diseases, makes the account most fascinating reading. The picturesque "wild west" days of Canadian medicine are gone forever.

V 19

Radiotherapy in the Diseases of Women. By Malcolm Donaldson, B.A., F.R.C.S., M.B., Physician Accoucheur with Charge of Out-Patients, St. Bartholomew's Hospital. Cloth. Price, 7/6. Pp. 131, with 16 illustrations. London: Hodder & Stoughton, Ltd., 1933.

As the author states, some books on radiotherapy are too dogmatic and optimistic; others express an unwarranted pessimism based on the disappointment of certain surgeons who seemed to expect that after a local application of radium every growth, however far advanced, would disappear, together with all secondary deposits. This pessimism has been accentuated by the unsatisfactory results of treatment in small institutions with inadequate amounts of radium, especially when applied in an amateur fashion. Attention is called to the requisite of much specialized knowledge and suitable apparatus. The present work attempts to state an authoritative, unbiased opinion on the value of radiation therapy in gynecology. In spite of the existing lack of agreement on the optimum time factor, the optimum intensity and the optimum dose, it is none the less true that radiation therapy has already revolutionized the treatment of many types of cancer, and there is little doubt that as more efficient methods are evolved and practiced the number of permanent good results will be considerably increased. Attention is called to the common mistake of considering radiotherapy as a technic employed purely for malignant diseases. Many benign conditions, such as menopausal hemorrhage, fibroids and tuberculosis, respond. Chapter II, on the biologic action of radium, is delightfully succinct, readable and satisfactory, in spite of its brevity. There are many tables of results in the British clinics, as well as other clinics throughout the world.

Corrective Physical Education. By Josephine Langworthy Rathbone, M.A., Instructor in Physical Education, Teachers College, Columbia University. Cloth. Price, $2.50. Pp. 292, with 153 illustrations. Philadelphia & London: W. B. Saunders Company, 1934.

This book presents, for students of physical education and physical therapy, the essential facts of human anatomy and physiology as they pertain to the subject of corrective exercise. There is nothing original in the text except its arrangement and the emphasis placed on certain phases of the subject. The material has been gathered from medical literature and from clinical experience. The purpose of this little book is twofold. First, it aims to convince the student of health and physical education that one of his greatest concerns should be to help children and young people build efficient and beautiful bodies. Second, it aims to furnish the student with some basic, fundamental facts and principles on which to build a sound program of reconstructive health and physical education.

Archiv und Atlas der normalen und pathologischen Anatomie in typischen Röntgenbildern. Die kombinierte Enzephal-Arteriographie. Von W. Löhr und W. Jacobi. Fortschritte auf dem Gebiete der Röntgenstrahlen. Herausgegeben von Prof. Dr. Grashey. Ergänzungsband XLIV. Paper. Price, 16 marks. Pp. 83, with 75 illustrations. Leipzig: Georg Thieme, 1933.

This work emanates from the surgical clinic of the state hospital at Magdeburg-Altstadt under the direction of Professor Löhr and from the state neurologic clinic at Magdeburg-Sudenburg under the direction of Professor Jacobi. The collaboration of these eminent authors has resulted in a distinct advance in the diagnostic methods relating to cranial lesions. The dangers of the method are recognized as being similar to but no greater than those attending encephalography and ventriculography. The authors prefer the introduction of air into the ventricular system through a lumbar puncture rather than its introduction into a ventricular puncture. Thorium dioxide sol is used as the opaque substance for arteriography. The authors' technic for the injection is described. A 5 cm. incision is made over the anterior upper border of the sternocleidomastoid muscle down to the internal carotid artery. The needle is introduced quietly for about 1.5 cm. and the roentgenograms made during the introduction of the opaque material. The injection has to be made quickly and the roentgenograms must be made promptly as the injection proceeds. Later films also have some value. Beautifully illustrative roentgenograms are reproduced, illustrating the topographic anatomy of the visualized blood vessels of the brain under normal and pathologic conditions. Cases reported include hemangioma of the face and brain, various cases of epilepsy, arteriosclerosis, hydrocephalus, and brain tumors. Even should the diagnostician not care to undertake this method of injection, he will find it valuable to have in his reference library this beautiful atlas of illustrative roentgenograms covering the various subjects listed.

Grundlagen und Praxis der Röntgenstrahlendosierung: Dosismessung und Dosisfestsetzung. Von Prof. Dr. med. H. Holthusen, leitender Oberarzt am Allgem. Krankenhaus St. Georg, Hamburg. Gemeinsam mit Dr. med. R. Braun, Assistant am Strahlen-institut des Allgem. Krankenhauses St. Georg, Hamburg. Paper. Price, 18 marks. Pp. 249, with 180 illustrations. Leipzig: Georg Thieme, 1933.

In recent years a complete revolution in x-ray dosage has taken place and the nations are now in agreement on an international unit of measurement called the roentgen, the symbol of which is r. Dosage meters of numerous types have been devised, and it is now possible with a small outlay for any physician practicing roentgenology to measure the output of his apparatus under various conditions and to give any desired dosage with reasonable accuracy. The physician must be specially trained in the production of radiation of given wavelengths and he must have the necessary apparatus with which to do this. The reading of the dosage, however, is not so complicated that any physician who sets himself up as a radiologist should feel excused from accurately measuring the radiation delivered to his patients. The present work is an attempt to explain some of the problems concerned in the effects of different doses of x-rays acting on the organism and the effects of the same dosage under different circumstances. The first part of the book is devoted to the physical aspects of the measurement of x-ray dosage, including an exhaustive treatise on the measurement of the quality and quantity of what constitutes a dose. The second portion of the book (from page 85 on) concerns the practical applications of existing knowledge of the physical and biologic effects. Readers who understand German will welcome this work as an authoritative, readable discussion of a complicated subject.

Précis de sémiologie médicale appliquée. Par M. Chiray, professeur agrégé à la Faculté de médecine de Paris, et P. Chêne, médecin assistant à l'Hôpital Saint-Antoine. Cloth. Price, 75 francs. Pp. 607, with 354 illustrations. Paris: Masson & Cie, 1934.

One of the contrasts between many of the French and English medical textbooks and the German and American ones is the condensation and smaller size of the former. There is probably a place for both types of books, the shorter serving as a more readable introduction to the subject, the latter usually being much superior as a book of reference. The book under review is of handy size and aims to be an introduction to medical symptomatology. The ground covered is amazing. Physiologic, anatomic, pathologic, clinical, roentgenographic and laboratory considerations are evoked for each of the systems of the body. Fever, alterations of the general state, skin diseases, syphilis and endocrine disorders are discussed. Considering the extensive nature of the subject, the book is remarkably accurate. As an introduction to medical students just entering their clinical years, such a book as this should be valuable. The obvious danger is that the attempted completeness might discourage the reading of more detailed textbooks on sections not adequately covered here.

Allgemeinnarkose und örtliche Betäubung: Zusammenfassende Darstellung für die Praxis auf pharmakologischer und klinischer Grundlage. Von Dr. Fritz Hesse, Privatdozent für Chirurgie, Dr. Ludwig Lendle, Privatdozent für Pharmakologie, und Prof. Dr. Rudolf Schoen, Direktor der medizinischen Universitäts-Poliklinik zu Leipzig. Mit einem Geleitwort von Erwin Payr. Paper. Price, 16 marks. Pp. 307, with 50 illustrations. Leipzig: Johann Ambrosius Barth, 1934.

The collaboration of a pharmacologist, a surgeon and an internist in the preparation of a monograph on anesthesia is an excellent idea. There are many important questions in this field, which in the past were discussed by pharmacologists or surgeons alone; such a group study can only be of benefit to the subject. The pharmacologist, Dr. Lendle, discusses the general and local anesthetics with much clarity and a critical attitude. The chapter on tribrom-ethanol and two other barbituric derivatives, pernocton and evipan, which are now under trial in Germany, is instructive. There is not much that the American medical profession can profit from the technical part written by the surgeon, Dr. Hesse. The description of methods in general and local anesthesia is rather brief; the illus-

trations are from other well known textbooks, some of them definitely antiquated. The most valuable part of the book was written by the internist, Professor Schoen, who discusses constitutional factors, diseases of the circulation, respiration, metabolism and the kidney in their relation to anesthesia. Particularly the preoperative investigation of the cardiovascular system is interesting, although it is perfectly obvious that a simple reliable test for latent myocardial insufficiency is still lacking. The book is recommended to all those who believe in a group study of patients coming to operation.

Medicolegal

Workmen's Compensation Acts: Testimony of Experts Who Ignore Uncontradicted Evidence Evaluated.—Daugherty, 48 years old and in good health, seemed to catch his heel in some way while descending a stairway in the course of his work. He fell backward and when he got up he seemed "dazed." No wound was observed. He was assisted to a place where he could sit down and was left there. The accident occurred Aug. 24, 1931, about 7 o'clock in the morning, near the end of the night shift on which Daugherty was employed, and he arrived home about the usual hour in the morning. From the day of his fall his health continued to fail. Ultimately he ceased work. On January 22, 1932, he died. The cause of death stated in the death certificate was "epilepsia caused by clog on brain." Daugherty's widow and daughter instituted proceedings for compensation under the workmen's compensation act of California.

Before the industrial accident commission, physicians who had attended Daugherty testified that his death was caused by intracranial trauma and concussion, followed by intracranial hemorrhage, the result of an accidental fall. On behalf of the employer and his insurance carrier, three physicians filed written reports, which apparently were accepted as evidence. One of these physicians stated that "the record does not show that the employee's death was due to an injury sustained on August 24, 1931," and notwithstanding the undisputed testimony as to the fall, he reported that it was questionable whether Daugherty really fell. The other two physicians made a joint report, recording their opinion that Daugherty's disability and death were not due to the fall but that the fall was the result of a "petit mal" type of seizure, the initial symptom of a preexisting lesion in the cerebrum. Daugherty, according to these two physicians, died from a preexisting tumor of the brain. The industrial accident commission denied compensation. The claimants appealed to the district court of appeal, second district, division 1, of California.

If the opinions of the physicians called by the employer were based on correct assumptions of fact, said the court, they would unquestionably support the decision of the industrial accident commission. These opinions, however, were faulty in that they did not accept the uncontradicated facts about the accidental fall, which marked the beginning of Daugherty's pathologic history. Two of the physicians summoned by the employer reported that the most striking symptom was convulsions, which began on the day the patient fell, but that there was no evidence to show that any head injury occurred at that time. They admitted, however, that it was not necessary to receive a direct blow on the head in order to sustain intracranial damage. These two physicians, said the court, failed to recognize that Daugherty's first convulsion occurred several hours after the accident and that it was the first convulsion he had ever had, so far as could be ascertained.

The only foundation for the decision and order of the industrial accident commission, said the court, rested on the opinions of three expert witnesses, based on assumptions by them different from the established facts. The opinions of these witnesses were regarded by the court as insufficient to produce such a conflict of evidence as would make the determination of the case by the industrial accident board final. The court accordingly annulled the award of the commission denying compensation.—*Daugherty v. Industrial Accident Commission (Calif.), 27 P. (2d) 774.*

Workmen's Compensation Acts: Bronchial Asthma or Anthracosis Due to "Accident."—The claimant's employment with the defendant oil refining company required him to clean the petroleum coke out of stills. While doing so he was exposed to gas fumes and coke dust. On April 14, 1931, there were more fumes than usual in the stills, which caused him to vomit and to suffer from shortness of breath. He became temporarily totally disabled, from what one physician stated was bronchial asthma and another diagnosed as anthracosis, and subsequently instituted proceedings for compensation under the Oklahoma workmen's compensation act. On his behalf, two physicians testified, in effect, that the excessive quantity of fumes present on April 14, while not the sole cause of his condition, was the exciting cause. The state industrial commission awarded him compensation. The employer brought an action in the Supreme Court of Oklahoma to reverse the award, contending that the claimant was suffering from an occupational disease, not compensable under the act, and not from a compensable accidental injury.

It is well settled, said the Supreme Court, that the Oklahoma workmen's compensation act does not apply exclusively to traumatic injuries. The act provides compensation for "accidental injuries." The adjective "accidental" does not indicate the existence of an accident but rather that the injury was either unintended or unexpected. An "accident" such as is contemplated by the act is distinguished from an occupational disease in that it arises from some definite event the date of which can be fixed with certainty, which cannot be done in the case of an occupational disease. Under the evidence here present, the condition of the workman was probably progressively brought about by the inhaling of gas fumes and dust for a period of time, but on a definite and specified date he went to work as usual and after working a short time became suddenly ill and was unable to work further. The evidence is that on this certain date he had reached his limit and that the breathing of the gas fumes and coke dust on this particular occasion was the exciting cause of his present condition. Under the circumstances his injury is the result of an accident and is not an occupational disease. The Supreme Court accordingly affirmed the award of compensation made by the industrial commission. —*Johnson Oil Refining Co. v. Guthrie (Okla.), 27 P. (2d) 814.*

Society Proceedings

COMING MEETINGS

American College of Surgeons, Boston, Oct. 15-19. Dr. Franklin H. Martin, 40 East Erie Street, Chicago, Director-General.

American Hospital Association, Philadelphia, Sept. 24-28. Dr. Bert W. Caldwell, 18 East Division Street, Chicago, Executive Secretary.

American Roentgen Ray Society, Pittsburgh, Sept. 25-28. Dr. Eugene P. Pendergrass, 3400 Spruce Street, Philadelphia, Secretary.

Associated Anesthetists of the United States and Canada, Boston, Oct. 15-19. Dr. F. H. McMechan, 318 Hotel Westlake, Rocky River, Ohio, Secretary.

Association of Military Surgeons of the United States, Carlisle Barracks, Pa., Oct. 8-10. Dr. J. R. Kean, Army Medical Museum, Washington, D. C., Secretary.

Colorado State Medical Society, Colorado Springs, Sept. 19-22. Mr. Harvey T. Setthman, 537 Republic Bldg., Denver, Executive Secretary.

Delaware, Medical Society of, Dover, Oct. 9-10. Dr. William H. Speer, 917 Washington Street, Wilmington, Secretary.

Indiana State Medical Association, Indianapolis, Oct. 9-11. Mr. T. A. Hendricks, 23 East Ohio Street, Indianapolis, Executive Secretary.

Inter-State Postgraduate Medical Association of North America, Philadelphia, November 5-9. Dr. W. B. Peck, 27 East Stephenson Street, Freeport, Illinois, Managing-Director.

Kansas City Southwest Clinical Society, Kansas City, Mo., Oct. 1-4. Dr. Hugh Wilkinson, 750 Minnesota Avenue, Kansas City, Kan., Secretary.

Kentucky State Medical Association, Harlan, Oct. 1-4. Dr. A. T. McCormack, 532 West Main Street, Louisville, Secretary.

Nevada State Medical Association, Reno, Sept. 21-22. Dr. Horace J. Brown, 120 North Virginia Street, Reno, Secretary.

New England Surgical Society, Burlington, Vt., Sept. 28-29. Dr. J. M. Birnie, 14 Chestnut Street, Springfield, Mass., Secretary.

Ohio State Medical Association, Columbus, Oct. 4-6. Mr. Don K. Martin, 1005 Hartman Theatre Building, Columbus, Secretary.

Omaha Mid-West Clinical Society, Omaha, Oct. 29-Nov. 2. Dr. Joseph D. McCarthy, 107 South 17th Street, Omaha, Secretary.

Oregon State Medical Society, Corvallis, Sept. 27-29. Dr. L. Howard Smith, Medical Arts Building, Portland, Secretary.

Pennsylvania, Medical Society of the State of, Wilkes-Barre, Oct. 1-4. Dr. Walter F. Donaldson, 500 Penn Avenue, Pittsburgh, Secretary.

Vermont State Medical Society, Burlington, Oct. 4-5. Dr. W. G. Ricker, 33 Main St., St. Johnsbury, Secretary.

Virginia, Medical Society of, Alexandria, Oct. 9-11. Miss Agnes V. Edwards, 1200 East Clay Street, Richmond, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL in continental United States and Canada for a period of three days. Periodicals are available from 1925 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Alabama Medical Association Journal, Montgomery

4: 1-40 (July) 1934

Treatment of Congestive Heart Failure. T. E. Harrison, Nashville, Tenn.—p. 1.

Recent Advances in Treatment of Chronic Bronchitis. J. F. Alison and J. P. Chapman, Selma.—p. 3.

Cancer of Uterus. N. R. Clarke Jr., Mobile.—p. 5.

Prepsychotic Trends in School Age. F. A. Kay, Tuscaloosa.—p. 12.

Granulocytopenia. C. Thorington, Montgomery.—p. 15.

American Journal of Anatomy, Philadelphia

55: 1-166 (July 15) 1934

X-Irradiation of Ovaries of Guinea-Pigs and Its Effect on Subsequent Pregnancies. Ida T. Genther, Cincinnati.—p. 1.

Microscopic Observations in Living Rabbit of New Growth of Nerves and Establishment of Nerve-Controlled Contractions of Newly Formed Arterioles. E. R. Clark, Eleanor L. Clark and R. G. Williams, Philadelphia.—p. 47.

Later Postnatal Skull Growth in Sheep. T. W. Todd and R. E. Wharton, Cleveland.—p. 79.

Effect of Thyroid Deficiency on Skull Growth in Sheep. T. W. Todd and R. E. Wharton, Cleveland.—p. 97.

Structural Changes During Contraction in Striped Muscle of Frog. H. E. Jordan, Charlottesville, Va.—p. 117.

*Studies on Experimental Rickets in Rats: I. Structural Modifications of Epiphyseal Cartilages in Tibia and Other Bones. G. S. Dodds and Hazel C. Cameron, Morgantown, W. Va.—p. 135.

Modifications of Epiphyseal Cartilages in Rickets.—Dodds and Cameron base their conclusions on the study of thirteen normal rats of both sexes, between the ages of 2 and 12 weeks, and nineteen rachitic rats from 5 to 12 weeks of age. 1. Rickets caused impairment of the growth of the long bones by the action of slowing of cell multiplication followed by its practical cessation, failure of cartilage cells to grow to normal thickness and crushing of cartilage matrix due to weakness resulting from inadequate calcification. 2. In mild rickets, the leg bones of rats continued to elongate at a reduced rate throughout the experiment. In severe rickets the leg bones grew in length for a limited time only. 3. The thickening of the epiphyseal cartilage in rickets is due not to accelerated growth but to retarded cartilage removal. 4. In mild rickets, cell multiplication, cell growth, calcification of the matrix and cartilage removal all continue, but calcification and removal lag behind cell multiplication and growth, with the result that the cartilage becomes somewhat thickened, mainly in the zone of fully grown cells. 5. In severe rickets, after about three weeks, calcification and cartilage removal stop entirely, and in a short time cell multiplication and cell growth stop also. This produces a thickened cartilage that is in a static condition. After a time, cartilage removal is resumed and progresses into the uncalcified cartilage in a modified manner, which results in the production of the peculiar rachitic metaphysis. The number of enlarged cells in the elongated rows does not increase demonstrably after the third week. 6. Cupping is produced by a greater retardation of calcification near the axis of the cartilage than near its margin. 7. In severe rickets there is sometimes a rejuvenation and resumed mitotic division of the enlarged cartilage cells in certain areas, which produces a structure much like ordinary hyaline cartilage.

American Journal of Diseases of Children

48: 1-242 (July) 1934

The Child's Family Adviser. C. A. Fife, Philadelphia.—p. 1.

Control of Dental Caries in Children. Martha Koehne, R. W. Bunting and Elise Morrell, with cooperation of Rebecca B. Hubbell and Mary Crowley, Ann Arbor, Mich.—p. 6.

Enteredepressant Factor in Stools and Spinal Cords of Monkeys Infected with Poliomyelitis. J. A. Toomey and W. F. von Oettingen, Cleveland.—p. 30.

Growth and Basal Metabolism: II. Basal Metabolism of Elementary School Children. I. Nakagawa, Tokyo, Japan.—p. 35.

Id.: III. Biometric Study of Basal Metabolism of Preschool and Elementary School Children. I. Nakagawa, Tokyo, Japan.—p. 39.

Paracentesis of Pericardium as a Therapeutic Measure. Lucy Porter Sutton, New York.—p. 44.

Cerebral Involvement in Acute Anterior Poliomyelitis: Report of Experimental Case. M. Brodie, Montreal.—p. 57.

*Cutaneous Lesions in Rheumatic Fever: Predominating Signs of Active Rheumatic Fever During Ward Epidemic. W. Chester and S. P. Schwartz, New York.—p. 69.

Acetarsone in Treatment of Syphilis in Negro Children. J. Yampolsky, with collaboration of D. F. Cathcart and I. Smith, Atlanta, Ga.—p. 81.

Susceptibility of Nursery School Children to Certain Communicable Diseases of Childhood. Ruth Updegraff, Iowa City.—p. 101.

Cutaneous Lesions in Rheumatic Fever.—In an epidemic of acute rheumatic fever, Chester and Schwartz observed that ten of twenty-one children showed cutaneous lesions as the predominating sign of the recurrence or exacerbation of rheumatic fever. The lesions were bluish, were not tender, and appeared mainly on the lateral surface of the legs and the extensor surface of the forearms. Most often they appeared as maculopapular purpuric spots and persisted for from one to six months. No scarring or desquamation followed their disappearance. During the period of observation, such cutaneous manifestations were not observed in children without cardiac conditions. In nineteen of these children an increased cardiac rate was an accompanying sign. Fever was present in a mild form on thirteen occasions. Pains in the joints and muscles, choreiform movements, epistaxis and congestive cardiac failure were each present in two instances. Hematologic studies in these children during the epidemic showed a persistent secondary anemia in all, a leukopenia and a positive Schilling count in two, and a transient thrombocytopenia and a positive tourniquet test in one. In one instance the PR interval was prolonged. The appearance of cutaneous lesions in children who have already had rheumatic fever should be considered a criterion of reactivity just as many other manifestations are now accepted.

American Journal of Syphilis and Neurology, St. Louis

18: 289-432 (July) 1934

Syphilitic Fibrosis and Status of Iodides in Present Day Treatment of Syphilis. S. S. Greenbaum and J. Cohane, Philadelphia.—p. 289.

Hemorrhagic Purpura Following Bismarsen. H. D. Niles, New York.—p. 300.

*Another Diagnostic Sign: Preliminary Report. J. B. Biederman, Cincinnati.—p. 306.

Trypansamide Dermatitis: Case Report and Survey of Literature. L. J. Bragman, Syracuse, N. Y.—p. 308.

Unsuspected Syphilis: Its Importance in Differential Diagnosis of Obscure Medical Cases. G. D. Astrachan, New York.—p. 311.

Effect of Lecithin on Experimental Syphilis in Rabbit. S. Harris Jr., Edna H. Tompkins, H. J. Morgan and R. S. Cunningham, Nashville, Tenn.—p. 333.

Standardization of Hemolytic System for Use in Complement Fixation Reaction for Laboratory Diagnosis of Syphilis. B. S. Levine, Chicago.—p. 341.

Zone of Precipitation in Kahn Test. Doris Wilson, M. B. Kurtz and N. W. Larkum, Lansing, Mich.—p. 355.

Value of Early Lumbar Puncture in Prognosis of Central Nervous System Syphilis. M. A. Schnitker, Boston.—p. 360.

Effect of Cerebral Lipoids on Basal Metabolism in General Paresis: Oxidation Reduction in General Paresis. E. T. Hoverson, Kankakee, Ill.—p. 373.

Another Diagnostic Sign in Syphilis.—Biederman discusses a diagnostic aid which is concerned with a change in the appearance of the anterior pillars of the throat. The anterior pillars in the normal throat have a certain healthy pinkish color merging imperceptibly with the pink of the surrounding healthy mucous membrane. During the recent examinations of the throats of a large number of patients having so-called latent syphilis it was observed that frequently there was an associated change in the appearance of the anterior pillars. This change was apparently due to an alteration in color in which the pillars assume a dark, dusky red shade, in a well defined congested area. This area began at the base of the pillars and extended upward from 0.5 to 2.5 cm. and was approximately from 6 to 10 mm. in breadth. The appearance was that of a definite vascular congestion. In the examination of 469 syphilitic patients this sign was present in 69.1 per cent. Not every case of syphilis presented this sign, nor could every patient having this sign be proved to be syphilitic. This sign should not be

confused with the secondary erythema of syphilis, which may be localized only on the anterior pillars or be present on any other portion of the mucous membrane.

Anatomical Record, Philadelphia

59: 395-506 (July 25) 1934

Effect of Ultracentrifugating on the Mitochondria of Hepatic Cells of Rat. H. W. Beams and R. L. King, Iowa City.—p. 395.
Observations on Innervation of the Macula Sacculi in Man. Mary Hardy, Baltimore.—p. 403.
*Cross Section Areas of Vessels That Form Torcular and Manner in Which Flow Is Distributed to Right and to Left Lateral Sinus. Erna Leonhardt Gibbs and F. A. Gibbs, Boston.—p. 419.
Cholecystographic and Fluoroscopic Study of the Reaction of Human Gallbladder to Faradic Stimulation of Stomach and Duodenum. E. A. Boyden and L. G. Rigler, Minneapolis.—p. 427.
Microfluoroscopic Study of Teleostean Kidneys. A. L. Graffin and M. J. Eisenberg, Boston.—p. 449.
Transformation of Adipose Tissue into Hemocytopoietic Tissue. H. E. Jordan, Charlottesville, Va.—p. 461.
New Type of Slide Holder for Projection of Serial Sections. J. L. Bremer, Boston.—p. 477.
Cinematic Study of Distribution of Pressure in the Human Foot. H. Elftman, New York.—p. 481.
Visualization of Movement of a Brominized Oil Along Peripheral Nerves. W. E. Sullivan and O. A. Mortensen, Madison, Wis.—p. 493.

Cross Sections of Vessels that Form the Torcular.—The Gibbses studied specimens of falx, tentorium and occipital dura, removed in a single piece at the time of postmortem examination. They observed that the torcular usually directs the greater part of the flow from the straight sinus into the left lateral sinus and the greater part of the flow from the superior sagittal sinus into the right lateral sinus. The cross section of any given vessel in the torcular is extremely variable, even relative to the cross section area of the other vessels in the same torcular. The cross section area of the right lateral sinus tends to be greater than that of the left lateral sinus.

Annals of Internal Medicine, Lancaster, Pa.

8: 1-114 (July) 1934

Inhibitory Hormones and Principle of Inverse Response. J. B. Collip, Montreal.—p. 10.
Lymphosarcoma and Hodgkin's Disease: Biologic Characteristics. S. Ginsburg, New York.—p. 14.
Encephalitis Epidemic in St. Louis. D. P. Barr, St. Louis.—p. 37.
*Changes in the ST Segment of Electrocardiogram in Acute Rheumatic Fever. Mary H. Easby and H. Roesler, Philadelphia.—p. 46.
Galactose and Urobilinogen Tests in Differential Diagnosis of Obstructive and Intrahepatic Jaundice. D. H. Rosenberg, Chicago.—p. 60.
Pleural and Pulmonary Complications of Carcinoma of the Esophagus. C. S. Keefer, Boston.—p. 72.
*Further Observations on Heart in Myxedema. J. Lerman, R. J. Clark and J. H. Means, Boston.—p. 82.
Small Intestinal Intubation: Experiences with Double Lumened Tube. T. G. Miller and W. O. Abbott, Philadelphia.—p. 85.
Diagnosis and Treatment of Certain Types of Chronic Diarrhea. P. W. Brown, Rochester, Minn.—p. 93.

ST Segment of Electrocardiogram in Acute Rheumatic Fever.—Easby and Roesler report three cases in which, during the course of a rheumatic infection, the following electrocardiographic changes were seen: Of the ST (RT) segment: a low or high take off, a convex upward bowing, a depression and an absence of the iso-electric portion. Of the T wave: iso-electricity, low voltage, origin below the basal line, simple inversion and coveshaped inversion. The electrocardiogram approached a normal form if the rheumatic infection cleared up, but even at the stage of complete recovery there was in one case persistence of iso-electricity of the T waves. In none of the three cases was evidence of a pericardial effusion present. These changes, though not pathognomonic for rheumatic fever, occur rather commonly, as a review of the literature shows. Anatomic studies from the literature are reported which support the conception that the ST (RT) and T changes express an alteration of the musculature caused by the effects of the acute infection on the coronary circulation.

The Heart in Myxedema.—Lerman and his associates discuss the changes in the size of the heart and in the blood pressure of eighteen patients having myxedema under thyroid medication, supplementing the data of thirty cases reported previously. It appears to be characteristic of the heart in myxedema to be enlarged and to undergo appreciable shrinkage as the disease is ameliorated by the administration of thyroid substance. The electrocardiograms of these patients taken before treatment showed abnormalities. None of the patients showed congestive failure.

Archives of Ophthalmology, Chicago

12: 1-156 (July) 1934

*Primary Glaucoma: Symptom Complex of Epidemic Dropsy. E. W. O. Kirwan, Calcutta, India.—p. 1.
Plea for Greater Uniformity in Methods of Field Taking. A. H. Thomasson, New York.—p. 21.
Neoplasms of Lacrimal Gland: Report of Two Cases. W. S. Davies, Ann Arbor, Mich.—p. 33.
Psychogenetic Disturbances of Vision. W. Stekel, Vienna, Austria, translation and abstract by L. S. London, New York.—p. 38.
Lamp for Determination and Measurement of Preferred Intensity of Light for Reading and Other Work. C. E. Ferree and G. Rand, Baltimore.—p. 45.
Blue Sclerotics, Fragile Bones and Deafness. J. Dessoff, Washington, D. C.—p. 60.
Bilateral Cavernous Sinus Thrombophlebitis Without Involvement of Ophthalmic Vein: Report of Case. J. J. Keegan, Omaha, and W. E. Ash, Council Bluffs, Iowa.—p. 72.
Instrument for Determining Course of Dark Adaptation and Measuring Minimal Light Threshold. J. B. Feldman, Philadelphia.—p. 81.
Metastatic Carcinoma of Optic Nerve and Choroid. C. E. McDannald and B. F. Payne, New York.—p. 86.
Involvement of Cornea in Arsenic Poisoning: Report of Case. A. V. Hallum, Atlanta, Ga.—p. 93.

Primary Glaucoma and Epidemic Dropsy.—Kirwan presents twelve cases that are illustrative of typical epidemic dropsy associated with glaucoma, from the study of which he points out that primary glaucoma in association with epidemic dropsy is due to toxins which contain bodies of the histamine group and that the glaucoma is of the chronic primary non-inflammatory type. The toxin circulating in the blood causes a vascular disturbance, which in some way upsets the normal function of the intra-ocular capillary endothelium as well as causes dilatation of the general capillary field, which leads to an increased output of tissue fluid. As the glaucoma is only part of a generalized disorder, the treatment should be medical if only a speedy method were known to rid the body of the toxins. The operative treatment is symptomatic and is intended to prevent permanent damage being done to the retina by the increased intra-ocular tension till the general disease has been cured by the elimination of the offending toxins.

Arch. of Physical Therapy, X-Ray, Radium, Chicago

15: 385-448 (July) 1934

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Wessely Radiation Apparatus in Laryngeal Tuberculosis: Further Experiments. J. W. Miller, New York.—p. 422.
Scientific and Practical Aspects of Massage. C. G. A. Björkman, New York.—p. 425.

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Symmetrical Traumatic Fractures of the Cranium; Symmetrical Fragmentation: Comments on Their Mechanism. E. R. LeCount and J. Hockzema, Chicago.—p. 171.
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I. Therapeutic Use of Bacteriophages Against the Colon Bacillus. W. J. MacNeal, Frances C. Frisbee and Martha Applebaum, New York.—p. 242.
Perforation of Jejunal Ulcer into the Free Abdominal Cavity. H. A. Singer and K. A. Meyer, Chicago.—p. 248.
*Pepsin in the Prevention of Abdominal Adhesions. K. Yardumian and D. H. Cooper, Pittsburgh.—p. 264.
Progressive Obstructive Jaundice: Changes in Certain Elements of the Blood and Their Relation to Coagulation. J. L. Carr and F. S. Foote, San Francisco.—p. 277.
Atlanto-Epistropheal Subluxations. M. B. Coutts, New York.—p. 297.
*Local Atrophy of Bone: III. Effects of Vitamin D and of Calcium on Local Atrophy and Union. F. Fischer, Detroit, and J. A. Key, St. Louis.—p. 312.
Review of Urologic Surgery. A. J. Scholl, Los Angeles; E. S. Judd, Rochester, Minn.; J. Verbrugge, Antwerp, Belgium; A. B. Hepler, Seattle; R. Gutierrez, New York, and V. J. O'Conor, Chicago.—p. 316.

Pepsin in the Prevention of Abdominal Adhesions.—In the prevention of abdominal adhesions, Yardumian and Cooper used an extract of pepsin, first in hydrochloric acid and then in glycerin, but free from iodine, in their experiments on forty-four rabbits, on which 104 laparotomies were per-

formed. Most of the animals survived the operations, but in those which died not a single case of intestinal obstruction was found at necropsy. Peritonitis and hemorrhage were the causes of death in all cases. To produce adhesions that may be considered permanent there must be sufficient trauma to produce an exudate capable of forming fibrin to a marked degree. Therefore the abdomen was entered through a midline incision, and the small intestine was rubbed vigorously with a gauze-covered finger for a distance of from 6 to 8 inches (15 to 20 cm.) in several places. The peritoneum on each side of the incision was forcibly scraped with the sharp end of a scalpel. The contents of the abdomen were replaced and the abdomen was closed in layers, catgut being used for the peritoneum and dermal for the skin. Before the peritoneum was closed the pepsin fluid was instilled. The active principle of pepsin was extracted from hog stomach with a 0.4 per cent solution of hydrochloric acid and with glycerin and water. The strengths used ranged from 0.5 to 2 per cent. When the abdomen was reopened and required extensive separation of adhesions, further trauma was not employed except incident to separation. The pathogenic adhesions were subdivided into four types: filmy, fine, moderate and dense. The cases were divided into two classes: class 1, in which filmy, fine or no adhesions were obtained, and class 2, in which moderate or dense adhesions resulted. The hydrochloric acid extract was used in one series and the glycerin and water extract in another. The results were as follows: In group 1 hydrochloric acid was used and nineteen operations were performed; 45.5 per cent of the cases were in class 1, and of these 25 per cent showed no adhesions. In group 2 glycerin and water was used and twenty-two operations were performed; 63.2 per cent of the cases were in class 1, and of these 39.1 per cent showed no adhesions. In group 3 a 0.5 per cent solution of pepsin in glycerin and water and traumatization by scarification were used and twenty-two operations were performed; 86.4 per cent of the cases were in class 1, and of these 75.8 per cent showed no adhesions. In group 4 a 0.5 per cent solution of pepsin in glycerin and water was used and lysis was obtained without further irritation; twenty-one operations were performed; 62 per cent of the cases were in class 1, and of these 33 per cent showed no adhesions. In group 5 lysis was obtained with irritation and of the twenty operations performed 50 per cent were in class 1, and of these 25 per cent showed no adhesions. Since their results show the decreased tendency to the formation of adhesions, the authors assume that the benefit from the digestive action of the pepsin is realized before absorption takes place. There was a gradual decline in the incidence of adhesions, with decreased trauma and in the presence of pepsin. The greatest tendency in the reformation of adhesions is when trauma is induced in the presence of existing adhesions and their separation, indicating the futility of any effort to prevent the reformation of adhesions in cases in which additional trauma is induced.

Effects of Vitamin D and of Calcium on Local Atrophy and Union of Bone.—The observations of Fischer and Key indicate that local atrophy of bone is the result of local conditions and that it cannot be prevented or appreciably lessened by an abundance of vitamin D and calcium in the diet. Likewise the healing and union of bones appear to require a certain amount of time, and no evidence was found that the addition of vitamin D and calcium to an adequate diet will reduce this time. The authors' patients received an adequate diet and their results should not be interpreted as evidence that patients convalescing from fractures and operations on the bones should not receive vitamin D and calcium. It is probable that a diet deficient in vitamin D and calcium would lead to increased local atrophy and delayed union of bone. It is further to be noted that therapeutic doses of vitamin D and calcium do not cause increased local atrophy or delayed union of bones.

Canadian Public Health Journal, Toronto

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Trends in Public Health and Medical Care in Canada. W. J. Bell, Toronto.—p. 316.
Ice Supplies and Associated Health Problems. A. E. Berry, Toronto. —p. 321.
Antituberculosis Activities in New Brunswick. R. J. Collins, St. John, N. B.—p. 326.

Delaware State Medical Journal, Wilmington

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Diagnosis and Treatment of Lesions of the Cranial Nerves. W. E. Dandy, Baltimore.—p. 153.
The Young Psychopath. C. Uhler, Farnhurst.—p. 160.

Endocrinology, Los Angeles

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Total Thyroidectomy in Diabetes Mellitus. R. M. Wilder, R. F. Foster and J. deJ. Pemberton, Rochester, Minn.—p. 455.
Urinary Excretion of a Depressor Substance (Kallikrein of Frey and Kraut) in Arterial Hypertension. A. H. Elliot and F. R. Nuzum, Santa Barbara, Calif.—p. 462.
Production of Testicular Descent with Water Soluble (Anterior Pituitary-Like) Fraction of Pregnancy Urine. H. S. Rubinstein, Baltimore.—p. 475.
Use of Pregnancy Urine and Prolan in Animal Industry. E. P. Tchernozatonskaia, Moscow, U. S. S. R.—p. 482.
*Iodine Tolerance Test for Thyroid Insufficiency. A. W. Elmer, Lwów, Poland.—p. 487.
Digestive Symptoms in Chronic Suprarenal Insufficiency (Addison's Disease). G. Marañon, P. Sala and G. Arguelles, Madrid, Spain. —p. 497.
*Fat Tolerance Test in Pituitary Disease. M. A. Goldzieher, I. Sherman and B. B. Alperstein, Brooklyn.—p. 505.
Luteinization of Ovary of Monkey by Means of Combined Use of Anterior Pituitary Extract and Extract of Pregnancy Urine. E. T. Engle, New York.—p. 513.
*Sex Determination Test of Dorn and Sugarman: Report of Fifty-One Experiments. D. P. Murphy and G. S. De Rényi, Philadelphia.—p. 521.
Optic Nerve and Myxedema. J. C. Mussio-Fournier and R. A. Larrosa Helguera, Montevideo, Uruguay.—p. 527.
Familial Infantilism Due to Hypophyseal and Thyroid Insufficiency. J. C. Mussio-Fournier, R. A. Larrosa Helguera, C. A. Castiglioni and B. Anido, Montevideo, Uruguay.—p. 533.
Uterine Reaction to Sex Hormones in the Immature Guinea-Pig. A. G. King, New Orleans.—p. 539.

Iodine Tolerance Test for Thyroid Insufficiency.—Elmer describes an iodine tolerance test that he has found to be highly characteristic of thyroid insufficiency. In the performance of the test, 0.658 Gm. of potassium iodide is dissolved, dried at a temperature of 110 C., in 500 cc. of iodine free water. This solution contains 1,000 micrograms of iodine in 1 cc. After sterilization the solution is kept in 1.3 cc. (1,300 micrograms of iodine) amounts in dark phials. After the skin is disinfected with iodine-free alcohol the contents of the phial are injected intravenously and the patient is instructed to drink a glass of water every one or two hours for six hours. The drinking of water facilitates the output of the urine, which in hypothyroidism may be insufficient. The urine is collected within the first six hours after the intravenous injection of iodine. The elimination of iodine within twenty-four hours may show at times only a slight difference in cases of hypothyroidism and normal thyroid function, but the differences are markedly evident in the first six hours after administration. The author adds the following modification to the method described previously for the determination: From 1 to 1.5 cc. of a 50 per cent solution of potassium carbonate is added to from 10 to 20 cc. of urine in a nickel dish. This is evaporated on a water bath, dried in an electric oven at a temperature of from 70 to 80 C. or over a gas burner, and incinerated in an electric oven with the presence of air or oxygen at a temperature of about 350 C. within from ten to fifteen minutes. After the dish is cooled, a little water is added to the residue. The contents are minced with an agate pestle and filtered with an ordinary blotting filter; the filtrate must be clear or at the most slightly yellow. The filter is incinerated with its content in the nickel dish in an electric oven within ten minutes at a temperature of 350 C. After complete incineration the residue of the filtrate must be pure white. The rest of the procedure is carried out according to the method reported previously. The author investigated fifty-five cases of different diseases with normal or disturbed function of the thyroid. The proportion of eliminated iodine in urine within six hours after intravenous injection of 1,300 micrograms of iodine as potassium iodide showed in hypothyroidism (seventeen cases) a constant and marked increase and amounted to from 23 to 40 per cent, and in euthyroidism (nineteen cases) from 12 to 20.5 per cent. In hyperthyroidism (ten cases) and in nontoxic goiter (nine cases) it was either decreased (as much as 0.8 per cent) or normal. The increased elimination was also noted in three patients with hyperthyroidism to whom iodine had been administered previously. This fact does

not diminish the value of the test, for not only the clinical picture but the simultaneous determination of the basal metabolic rate and the fasting blood iodine enables one in a definite way to differentiate between these two diseases and to detect the presence of hypothyroidism. The test is of especial value for the determination of atypical hypothyroid forms, for which the clinical picture, the determination of fasting blood iodine or the examination of the basal metabolic rate do not give sufficient grounds for the diagnosis of hypothyroidism. In all subjects showing a decreased basal metabolic rate the negative results of the test exclude thyroid insufficiency.

Fat Tolerance Test in Pituitary Disease.—Goldzieher and his collaborators confirm the presence of a fat metabolism hormone of the anterior lobe of the pituitary, which causes a rise of the acetone bodies of the blood. A similar rise of blood acetone after intake of a fat meal seems to denote the physiologic discharge of the fat metabolism hormone. A fat tolerance test was devised to demonstrate the functional status of the anterior lobe of the pituitary. The test meal consists of 4 ounces of heavy sweet cream, 4 ounces of milk, 1 ounce of butter and two slices of toast. Examination of 109 cases after a test meal showed absence of the physiologic rise of blood acetone bodies in fifty-six cases, which consisted almost exclusively of those of pituitary deficiency. A rise was obtained in the normal controls, in all other endocrinopathies and also in some hypopituitary patients. The physiologic reaction was obtained in those hypopituitary patients who had been under specific organotherapy over a prolonged period. Analysis of the forty-two cases in which the blood acetone content dropped after a test fat meal showed a low specific dynamic action averaging 6.3 per cent; the blood uric acid in these cases averaged 3.9 mg. per cent. The consistent combination of a low specific dynamic action, high uric acid and increased fat tolerance appears to characterize pituitary insufficiency. Preliminary studies suggest that the determination of oxybutyric acid instead of the total acetone content is likely to improve the results of the fat tolerance test. The relation of the fat metabolism hormone to the thyrotrope hormone is discussed and the distinct identity of the two principles is emphasized.

Sex Determination Test of Dorn and Sugarman.—In determining the validity of the Dorn and Sugarman test for prophesying the sex of the unborn fetus, Murphy and De Rényi injected (intravenously) urine from fifty-one women in the last two months of pregnancy into the same number of male rabbits approximately 3 months of age. Gross and microscopic examination of testicles removed both before and after treatment gave the following results: 1. The urine injection had no appreciable effect on the gross appearance of the testicles, the diameters of the seminiferous tubules or the number of different kinds of germinal epithelial cells. 2. In an insignificant number of instances the treatment may have initiated or increased spermatogenic activity. 3. The testicles of animals treated with urine from women who later were found to have given birth to female children exhibited the same microscopic picture as the testicles from animals treated with urine from women who had later given birth to male children. From these observations it is concluded that the urine of pregnant women does not offer a means for predicting the sex of the unborn child by the rabbit testicle reaction. The use of the testicle reaction for determining the existence of pregnancy in the human being would also seem to be of little if any value.

Florida Medical Association Journal, Jacksonville

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Ophthalmology and Its Relation to General Medicine and Surgery. N. M. Black, Miami.—p. 9.
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Cancer of Larynx. C. G. Coakley, New York.—p. 23.
Essential Features in Diagnosis and Treatment of Acute Fractures of the Skull. J. R. Wells, Daytona Beach.—p. 25.

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Angina Pectoris: Report of Case Relieved by X-Radiation. J. H. Lucinian, Miami.—p. 65.

Journal of Bacteriology, Baltimore

28: 1-110 (July) 1934

Variation and Filtrability Studies on Bacillus Mesentericus and Bacillus Vulgatus. Catherine S. Flynn and L. F. Rettger, New Haven, Conn.—p. 1.
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Relation of Micro-Organisms to Carotenoids and Vitamin A: I. Occurrence of Carotene in Bacteria. Mary A. Ingraham and C. A. Baumann, Madison, Wis.—p. 31.
Organism with Transverse Capsule. R. Thompson, Montreal.—p. 41.
Pneumococcus Variants: I. Intermediate Forms and Influence of Environment in Their Production During In Vitro S to R and R to S Transitions. J. R. Paul, with technical assistance of Helen M. Dedrick, New Haven, Conn.—p. 45.
Id.: II. Dissociants of R Pneumococci and Their Relation to Streptococcus Viridans. J. R. Paul, with technical assistance of Helen M. Dedrick and Elma Krumwiede, New Haven, Conn.—p. 69.
Synthesis of Aromatic Amino Acids from Inorganic Nitrogen by Molds and Value of Mold Proteins in Diets. C. E. Skinner, Minneapolis.—p. 95.
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Journal of Experimental Medicine, New York

60: 127-268 (Aug. 1) 1934

Immunologic Study of the A Substance or Acetyl Polysaccharide of Pneumococcus Type I. J. F. Enders and C.-J. Wu, Boston.—p. 127.
Varying Influence of Tuberculous Rabbit Plasma on Growth of Fibroblasts in Vitro. H. F. Swift, J. K. Moen and E. Vaubel, New York.—p. 149.
Fate of B C G and Associated Changes in the Organs of Rabbits. M. B. Lurie, Philadelphia.—p. 163.
Results of Irradiating Staphylococcus Aureus Bacteriophage with Monochromatic Ultraviolet Light. F. L. Gates, Cambridge, Mass.—p. 179.
*Fate of Bilirubin in Small Intestine. M. S. Sackey, C. G. Johnston and I. S. Ravdin, Philadelphia.—p. 189.
Transplantation of Tooth Germ Elements and Experimental Heterotopic Formation of Dentin and Enamel. C. B. Huggins, H. R. McCarroll and A. A. Dahlberg, Chicago.—p. 199.
*Vaccination of Monkeys and Laboratory Workers Against Psittacosis. T. M. Rivers and F. F. Schwentker, New York.—p. 211.
Biochemical Studies on Fibrinolytic Activity of Hemolytic Streptococci: I. Isolation and Characterization of Fibrinolysin. R. L. Garner and W. S. Tillett, Baltimore.—p. 239.
Id.: II. Nature of the Reaction. R. L. Garner and W. S. Tillett, Baltimore.—p. 255.

Fate of Bilirubin in Small Intestine.—Since there was no loss of bilirubin from the jejunal loop and no loss of bilirubin when pigment was incubated with juice from the loop segment or juice from the entire small intestine, Sackey and his associates conclude that the intestinal juice alone has no effect in converting bilirubin to urobilin during a period of two hours and that in the jejunal loop there was no absorption of pigment or no conversion to urobilin. The experiments, on dogs, showing loss of pigment in the entire intestinal tract suggest that in some place other than the jejunal portion of the intestine the combined activity of intestinal contents and intestinal cells does affect the bilirubin in the intestine. Whether the loss of bile pigment under such circumstances is due entirely to conversion, to conversion and absorption, or to absorption of bilirubin as such remains to be answered.

Vaccination Against Psittacosis.—The results of the work of Rivers and Schwentker indicate that, when psittacosis virus produces a pneumonia in man, its portal of entry is the upper respiratory tract. The fact is plain that man is unlikely to contract psittacosis pneumonia as the result of the subcutaneous or intramuscular introduction of active virus. It is not known whether the persons who have received repeated intramuscular injections of active virus possess an increased resistance to psittacosis in addition to the neutralizing antibodies in their serums and, if they do possess such a heightened resistance, there is no evidence in regard to the length of time they will retain it. In view of the results that they obtained with monkeys, they believe that one is justified in assuming that a certain degree of protection against psittacosis was afforded the human volunteers by means of vaccination. Monkeys that have recovered from psittacosis pneumonia have an increased resistance to infection with the virus and possess neutralizing antibodies in their serums. Large amounts of active psittacosis virus can be introduced intravenously and intramuscularly into monkeys without the production of a serious infection, such as pneumonia. Relatively small amounts of virus introduced intratracheally into monkeys usually lead to psittacosis pneumonia. Monkeys vaccinated intramuscularly with unattenuated psittacosis virus have an increased resistance to the active agent and possess neutralizing antibodies in their serums.

Journal of General Physiology, New York

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Ultraviolet Absorption Spectrum of Pepsin. F. L. Gates, Cambridge, Mass.—p. 797.
Search for Mitogenetic Radiation by Means of Photo-Electric Method. E. Lorenz, Boston.—p. 843.

Journal of Infectious Diseases, Chicago

55: 1-122 (July-Aug.) 1934

Experimental Dysentery Produced by Introducing Bacterium Dysenteriae (Flexner) into Isolated Segments of the Colon of Monkeys. G. M. Dack and Elizabeth Petran, Chicago.—p. 1.
*Elimination of Brucella Abortus with Milk of "Carrier" Cows. R. Thompson, Quebec, Que.—p. 7.
Serologic Reactions of Cultures of Monilia and of Some Other Yeastlike Fungi. Lois Almon and W. D. Stovall, Madison, Wis.—p. 12.
Influence of Nutritive Conditions on Acid-Fastness of Bacteria. D. W. Bruner, Ithaca, N. Y.—p. 26.
Heat Resistance of Clostridium Botulinum in Canned Sea Foods. O. W. Lang and S. J. Dean, San Francisco.—p. 39.
Rapid Agglutination Test for Infectious Abortion in Cattle. C. R. Donham and C. P. Fitch, St. Paul.—p. 60.
*Active Immunization Against Tetanus Infection with Tetanus Toxoid. D. H. Bergey, Philadelphia.—p. 72.
*Dissociation of Streptococci Obtained from Acute Rheumatic Fever. Katharine M. Howell and Eleanor P. Burton, Chicago.—p. 79.
Study of Vaccinal Immunity by Means of Complement Fixation. R. F. Parker, New York.—p. 88.
Effect of Low Temperature Freezing on Encysted Larvae of Trichinella Spiralis: Studies on Muscle of Rats, Guinea-Pigs and Hogs. J. B. Blair and O. W. Lang, San Francisco.—p. 95.
Diphtheria Bacilli: Cultural and Toxigenic Characteristics of Five Hundred Strains in Relation to Their Clinical Occurrence. L. W. Smith, M. E. Sano and Josephine J. Jarema, New York.—p. 105.
*Protective Action of Sodium Thiocyanate Against Dysentery Toxin (Shiga): Experimental Study in Dogs and Rabbits. P. E. Reid, M. X. Anderson, H. I. Stubblefield and A. C. Ivy, Chicago.—p. 112.

Elimination of Brucella Abortus with the Milk of "Carrier" Cows.—Thompson examined the milk of ten high producing cows that never manifested clinical symptoms of infectious abortion but whose blood serum showed agglutinins for Brucella abortus in dilutions of from 1:50 to 1:500 for the presence of Brucella abortus at intervals of thirty days over an entire lactation period by both the direct petri plate method and inoculation of guinea-pigs. The results indicate that inoculation of guinea-pigs is slightly more efficient than the direct petri plate method of examining milk for the detection of Brucella abortus. The results further demonstrate that Brucella abortus may be constantly eliminated with the milk of cows classified as "healthy carriers."

Immunization with Tetanus Toxoid.—Bergey observed that alum-precipitated tetanus toxoid induces, in a dose of 1 cc., a higher degree of immunity than three doses of the toxoid without alum. The tetanus toxoid is of value only as a prophylactic agent against tetanus infection. It has no therapeutic value in persons who are infected with tetanus bacilli. Active immunization against tetanus infection should be carried out as follows: A primary stimulus is given by injecting a dose of 1 cc. of the toxoid; this is followed by a rest period of three months, and then a secondary stimulus of 1 cc. of toxoid is given. On injury, a third dose of 1 cc. of the toxoid is given.

Dissociation of Streptococci Obtained from Acute Rheumatic Fever.—Howell and Burton endeavored to dissociate the freshly isolated strains of streptococci obtained by blood culture from four patients during acute attacks of rheumatic fever. The four strains were not in the same group according to bacteriologic classification. On blood agar, two of the four strains (102 and 109) were nonhemolytic; one (107) was hemolytic, and one (108), green producing. The nonhemolytic strains grew in broth with uniform turbidity; the others grew with granular sediment. The four strains could not be classified by immunologic methods. Rabbits were immunized with each of the four bacterial strains, and the resulting immune serums were treated for agglutinins, opsonins and complement fixation antibodies. The four freshly isolated strains of streptococci remained virulent, smooth and stable for eight months in spite of efforts to incite dissociation by chemical and physical means and by inoculation of animals. Elements of dissociation in the strains are suggested by pleomorphism and by occasional S-R colonies. The experiments with animals suggest little possibility of changing a smooth virulent strain to a rough avirulent strain in vivo. Accepting the definition that dissociation is a permanent change that takes place in a bacterium and is then transmitted to subsequent generations, the authors have so far been unable to dissociate the four strains of streptococci obtained by blood culture from patients with acute rheumatic fever.

Protective Action of Sodium Thiocyanate Against Dysentery Toxin (Shiga).—Reid and his associates investigated the accidental discovery by Reid and Stubblefield and Crandall and Anderson that dogs which had received thiocyanate from four to five weeks previously failed to react in the usual manner after receiving lethal doses of Shiga dysentery bacillus filtrate. They found that the intravenous (20 mg. per kilogram of weight) or oral (60 mg. per kilogram of weight) administration of sodium thiocyanate from fourteen days to several (four or five) weeks prior to the administration of a toxic filtrate of Shiga dysentery bacilli affords protection against the lethal action of the filtrate in some but not in all dogs. They can offer no explanation. They did not obtain any protection in rabbits.

Journal of Nervous and Mental Disease, New York

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Sex Factors in Intelligence. A. J. Rosanoff, Leva M. Handy, Isabel Avis Rosanoff and Christine V. Inman-Kane, Los Angeles.—p. 125.
Intracranial Hydrodynamics: Central Nervous System Shock and Edema Following Rapid Fluid Decompression of the Ventriculo-subarachnoid Spaces. J. H. Masserman, Baltimore.—p. 138.
Postencephalitic Narcolepsy and Cataplexy: Muscles and Motor Nerves Electrical Inexcitability During the Attack of Cataplexy. J. C. Mussio Fournier and R. A. Larrosa Helguera, Montevideo, Uruguay. —p. 159.
Galvanic Skin Reflex and Blood Pressure Reactions in Psychoneuroses. A. P. Solomon and T. L. Fentress, Chicago.—p. 163.
The Migrainous Patient a Constitutional Study. Grace A. Touraine and G. Draper, New York.—p. 183.

Journal of Nutrition, Philadelphia

8: 1-124 (July 10) 1934

Studies of Raw Egg White Syndrome in Rats. W. D. Salmon and J. D. Goodman, Auburn, Ala.—p. 1.
Storage of Vitamin A in Cattle. H. R. Guilbert and G. H. Hart, Davis, Calif.—p. 25.
Vitamin A Storage in Livers of Turkeys and Chickens. H. R. Guilbert and W. R. Hinshaw, Davis, Calif.—p. 45.
Variations in Potency of Certain Foodstuffs in Cure of Dermatitis Induced in Rats by Dietary Egg White. Helen T. Parsons and Jane G. Lease, with cooperation of Eunice Kelly, Madison, Wis.—p. 57.
Relation of Avitaminosis C to Blood Clotting. A. K. Presnell, Cincinnati.—p. 69.
Development of Xerophthalmia and Keratinization of Epithelial Tissue on Withdrawal of Vitamin A from Diet of Monkey (Macacus Rhesus), Guinea-Pig, Rabbit and Adult Albino Rat. Rossleene Arnold Hetler, St. Louis.—p. 75.
Vitamin D in Blood and Milk of Cows Fed Irradiated Yeast. R. F. Light, L. T. Wilson and C. N. Frey, Plainsboro, N. J.—p. 105.
Partial Regression in Analysis of Comparative Feeding Trial Data: Part I. Use of Method. E. W. Crampton and J. W. Hopkins. —p. 113.

Journal of Pediatrics, St. Louis

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Poliomyelitis Treated in Drinker Respirator: Analysis of Eighty-Eight Cases and Control Series of Sixty-Eight Cases: I. Clinical Studies in Poliomyelitis. J. F. Landon, New York.—p. 1.
Serum Therapy in Preparalytic Poliomyelitis: II. Clinical Studies in Poliomyelitis. J. F. Landon, New York.—p. 9.
Differential Diagnosis of Acute Poliomyelitis: III. Clinical Studies in Poliomyelitis. J. F. Landon, New York.—p. 16.
Ephedrine Sulphate in Treatment of Bulbar Type of Poliomyelitis: IV. Clinical Studies of Poliomyelitis. J. F. Landon, New York.—p. 29.
Sporadic Poliomyelitis: Study of Two Hundred Cases: V. Clinical Studies in Poliomyelitis. J. F. Landon, New York.—p. 33.
*Prevention of Initial Loss of Weight in New-Born by Use of Hydrating Solution. L. J. Halpern, Chicago.—p. 40.
Acute Cholecystitis with a Gallstone in Child Eleven Years of Age. J. K. Berman, Indianapolis.—p. 47.
*Huge Tension Cavity in Primary Pulmonary Tuberculosis in Infant. S. Sanes and F. E. Kenny, Buffalo.—p. 51.
*Lymphatic Leukemia Resembling Rheumatic Fever in Child: Report of Case. Lucy Porter Sutton and Olive Bosworth, New York.—p. 61.
Early Signs of Vitamin A Deficiency in Albino Rats. F.-F. Chu and Anna Murphy, Boston.—p. 68.
Parenteral Use of Carotene in Treatment of Vitamin A Deficiency in Albino Rats. F.-F. Chu and Harriet Coady, Boston.—p. 75.

Prevention of Initial Loss of Weight in the New-Born.—Halpern confirms the contention of Kugelmass and his collaborators that hydrating solution reduces the initial loss of weight. In seventy-five new-born infants who received a

hydrating solution for from one to four days after birth the reduction amounted to 3.94 per cent, and to 3.68 per cent in thirty-four infants who received it for the first two days of life. Birth weight was recovered on an average of from 1.3 to 1.5 days earlier in the treated infants than in a group of seventy-five controls. An average intake of 11 per cent of the solution per birth weight, affording an average of 161 calories, was obtained on the second day of life. A slight benefit resulted from the administration of the solution on the subsequent progress, particularly striking in those infants who received the solution for the first two days only. The administration of the solution for the first two days of life yielded better results from the standpoint of reduction of initial loss of weight, recovery of birth weight and effect on subsequent progress than when it was given for the first three days, the first day or the first four days.

Huge Tension Cavity in Primary Tuberculosis.—Sanes and Kenny report a case of primary pulmonary tuberculosis in a Negro infant, aged 10 months, the pathologic features of which—cavitation, bronchogenic spread and absence of acute miliary dissemination—resembled those of postprimary tuberculous infection. The primary cavity was of singularly large size. Clinically, the cavity showed distinct tympany.

Lymphatic Leukemia Resembling Rheumatic Fever.—Sutton and Bosworth describe a case of lymphatic leukemia that draws attention to the fact that joint symptoms may be a prominent part of the picture of acute leukemia in children and emphasizes the fact that the absence of evidence of acute carditis in the presence of polyarthritis in a child less than 3 years of age is presumptive evidence that the carditis is not rheumatic in origin. In their case recurrent joint symptoms masked the true nature of the disease for six months during two admissions to the ward and persisted throughout the remaining six months of life. The clinical picture was atypical enough to cast doubt on the initial diagnosis of rheumatic fever, for it was felt that in so young a child an extensive and protracted polyarthritis should be accompanied by a severely damaged heart, a factor that was lacking in this instance. The child was admitted three times in the course of one year for pain and swelling of various joints. It was not until the third admission, when a generalized lymphadenopathy was also present, that the diagnosis of acute leukemia was made.

Journal of Urology, Baltimore

32: 131-230 (Aug.) 1934

*New Colorimetric Test for Renal Function Using Intravenous Iodine Preparations: Preliminary Report. R. H. Herbst and G. O. Baumrucker, Chicago.—p. 131.

Incontinence of Vesical and Renal Origin (Relaxed Urethra and Vaginal Ectopic Ureter): Case Report. M. B. Wesson, San Francisco.—p. 141.

Ketogenic Diet in Treatment of Bacilluria of Females. E. N. Cook, Rochester, Minn.—p. 153.

Primary Pneumaturia: Report of Case. F. W. Mulsow and C. L. Gillies, Cedar Rapids, Iowa.—p. 161.

Kidney Suspension by Use of Fascia Lata. J. E. Strode, Honolulu, Hawaii.—p. 171.

Differential Diagnosis and Treatment of Tumors of the Testicle: Report of Case of Bilateral Fibroma of the Testicles. R. B. Henline, New York.—p. 177.

*New Sign in Differential Diagnosis Between Torsion of Spermatic Cord and Epididymitis. D. T. Prehn, Brooklyn.—p. 191.

Staining and Morphology of Human Spermatozoon. W. W. Williams, A. McGugan and H. D. Carpenter, Springfield, Mass.—p. 201.

Interesting Case of Priapism Due to Multiple Secondary Carcinomatous Nodules in the Corpora Cavernosa. J. S. Kessell, East Orange, N. J. —p. 213.

Clinical Study of Male Sterility, with Particular Reference to Endocrine Dysfunction and Therapy. C. W. Charny, Philadelphia.—p. 217.

Colorimetric Test for Renal Function.—Herbst and Baumrucker describe a colorimetric test for renal function using diodrast intravenously. A specimen of urine containing excreted diodrast is diluted to 1,000 cc. with tap water, and 0.5 cc. is placed in a pyrex test tube and evaporated to dryness; 3 drops of a saturated solution of potassium nitrate is added and again evaporated to dryness; 2 cc. of concentrated sulphuric acid is added and the whole is corked and heated. It is then cooled, and water is added and cooled again. It is then shaken with 2 cc. of chloroform and compared to a colorimeter. The entire procedure is performed in the same test tube from evaporation to color comparison and does not take more than from seven to ten minutes. The color scale may be made by dissolving 100 mg. of iodine in 128.5 cc. of chloroform and adding 0.1 cc. of this solution for each 5 per cent, diluting up to 2 cc. with chloroform. The acidified iodine-chloroform solution has a slightly deeper shade than the plain iodine-chloroform solution. This can be corrected by layering a few cubic centimeters of water acidified with sulphuric acid over the iodine-chloroform solution. The iodine-chloroform scale, if made in sealed glass ampules, will keep its color for months without changing. This test, unlike the phenolsulphonphthalein test, can be performed on bloody urine. The urine is diluted to 1,000 cc. to have it correspond more closely to the phenolsulphonphthalein test.

Differential Diagnosis Between Torsion of Cord and Epididymitis.—Prehn discusses a diagnostic sign for the differential diagnosis of torsion of the spermatic cord and epididymitis. He illustrates this sign by reporting two cases of torsion in which acute epididymitis was ruled out, as elevation of the scrotum increased the pain and tenderness and did not give relief as it would in acute epididymitis. The swelling of the scrotum by edema frequently makes it difficult to distinguish the testicle from the epididymitis which may accompany torsion, and then the scrotal contents are not differentiated. Tenderness along the cord may be present with epididymitis. Nausea and vomiting with some elevation of temperature may be present in both conditions but are more likely in torsion and are usually more severe. Suspicion should always center on inguinal canal or lower abdominal pain when the scrotal sac on one side or both sides is empty to rule out torsion of the cord. In the undescended testicle, with a tumor in the inguinal canal, the condition calls for surgical intervention. It is more important to differentiate torsion from acute epididymitis in the descended testicle, because the treatment here is usually quite different. The treatment should be surgical. Torsion may be prevented by plastic correction of the undescended testicle before puberty by suturing the organ to the scrotum. After puberty, removal is indicated in the partially descended testicle, owing to the danger of peritoneal injury. In the fully descended testicle, if early, the torsion may be untwisted and repaired plastically; otherwise removed.

Kentucky Medical Journal, Bowling Green

32: 333-388 (July) 1934

Growing Interdependence of Medical and Dental Practice. O. B. Coomer, Louisville.—p. 334.

Dental Infection as Related to the Field of Medicine. J. Stites, Louisville.—p. 337.

Clinical Consideration of Brain Tumors. R. G. Spurling and F. Jelsma, Louisville.—p. 348.

Diagnosis of Hyperthyroidism. F. J. Clark, Henderson.—p. 359.

Jaundice: Its Cause and Cure. C. F. Long, Elizabethtown.—p. 362.

Carcinoma of the Lip: Report of Cases. L. W. Frank and C. D. Enfield, Louisville.—p. 366.

Case for Diagnosis. G. Aud, Louisville.—p. 368.

Diagnosis and Treatment of Chronic Sinus, with Especial Reference to the Antrum. C. T. Wolfe, Louisville.—p. 372.

Birth Control. G. Fulton, Louisville.—p. 378.

Epidemic Encephalitis. G. Eith, Newport.—p. 383.

Prurigo Nodularis: Report of Case. W. U. Rutledge, Louisville. —p. 385.

Medical Bull. of Veterans' Adm., Washington, D. C.

11: 1-76 (July) 1934

Colitis. J. A. Bargen.—p. 1.

Spondylolisthesis. H. W. Meyerding.—p. 10.

*Thrombo-Angiitis Obliterans: Significant Findings and a Theory of Etiology. H. J. Gray.—p. 16.

Occurrence of Typhoid Fever After Prophylactic Inoculation. E. J. Butzke.—p. 24.

Vitamin D Milk in Pulmonary Tuberculosis. M. L. McClung and L. G. Glickman.—p. 26.

Artificial Pneumothorax Treatment of Pulmonary Tuberculosis in Negroes. A. D. Simington.—p. 29.

Results of Extra Intensive Treatment of General Paralysis of the Insane. C. L. Carlisle and R. T. O'Neil.—p. 31.

Gastrohepatic Fistula. C. G. Lyons.—p. 59.

Supernumerary Stomach with Duodenal Bulb Associated with Diaphragmatic Hernia. W. A. Cashion.—p. 61.

*Fungicidal Treatment of Pruritus Ani. C. M. Creech and C. J. McGillicuddy.—p. 63.

Etiology of Thrombo-Angiitis Obliterans.—Gray believes that: 1. Thrombo-angiitis obliterans is the end result of an intestinal putrefaction, with resultant toxins in the blood stream having a selective action on the vascular intima. 2. Intensive research into metabolism and blood chemistry will reveal the cause and develop preventive measures for thrombo-angiitis obliterans and probably other vascular diseases. 3.

Tobacco and infections are only predisposing factors. 4. In early cases and cases with gangrene of the ends of the toes, medical treatment should be used, while in gangrene with severe involvement amputation is the procedure. In the intermediate group, in which vasospasm is noted as improved, sympathetic ganglionectomy is indicated by the work of others, but the author prefers vaccine treatment. Thrombo-angiitis obliterans, angina pectoris, arteriosclerosis, Raynaud's disease, erythromelalgia and sclerodactylia are possibly different from one another only in the distribution and clinical manifestation of the same etiologic disease.

Treatment of Pruritus Ani.—In pruritus ani, with the area infiltrated, Creech and McGillicuddy swab the area lightly with a 30 per cent solution of salicylic acid in alcohol. This is repeated at intervals of seventy-two hours. The patient is instructed to swab the perianal and pericoccygeal regions freely night and morning with a 1 per cent solution of copper sulphate. The infiltration disappears after a few applications. The salicylic acid solution, if lightly applied, causes only moderately severe pain, which lasts but a few minutes. In no case has the copper solution caused irritation.

Military Surgeon, Washington, D. C.

75: 1-56 (July) 1934

Out of the Grand Canyon on a Litter: Sequel. R. P. Williams.—p. 1.
A Naval Medical Officer on Duty with the Civilian Conservation Corps. C. R. Ball.—p. 12.
Tuberculosis Among Doctors and Nurses at Fitzsimons General Hospital. W. C. Pollock and J. H. Forsee.—p. 17.

Minnesota Medicine, St. Paul

17: 367-438 (July) 1934

Roentgenology in Diagnosis. C. G. Sutherland, Rochester.—p. 367.
Diagnosis and Treatment of Hay Fever, with Especial Reference to Minnesota. R. V. Ellis and C. O. Rosendahl, Minneapolis.—p. 378.
Control of Tuberculosis: Its Economic and Scientific Factors. E. S. Mariette, Oak Terrace.—p. 393.
Surgical Treatment of Pulmonary Tuberculosis. T. J. Kinsella, Oak Terrace.—p. 399.
Eczema in Infancy and Childhood. T. L. Birnberg, St. Paul.—p. 407.

Missouri State Medical Assn. Journal, St. Louis

31: 261-304 (July) 1934

Treatment of Some Diseases of the Blood. J. H. Musser and D. O. Wright, New Orleans.—p. 261.
Pathology of Carcinoma of the Breast. L. H. Jorstad, St. Louis.—p. 272.
Radical Operation for Cancer of the Breast. W. E. Leighton, St. Louis.—p. 275.
Radiologic Point of View of Cancer of the Breast. E. C. Ernst, St. Louis.—p. 277.
Cancer from the Internist's Point of View. C. M. Stroud, St. Louis.—p. 281.
Endometriosis. E. F. Schmitz, St. Louis.—p. 282.

31: 305-340 (Aug.) 1934

Tetanus Infection Treated with Antitoxin and Avertin. F. A. Harrison, Springfield, and H. L. Higgins, Boston.—p. 305.
*Clinical Appraisal of Water Metabolism. B. Y. Glassberg, St. Louis.—p. 308.
Roentgen Therapy of Bone Metastases Following Carcinoma of the Breast. J. C. Peden, St. Louis.—p. 310.
*Pyridium in Treatment of Gonorrheal Vaginitis in Children. T. K. Brown, S. D. Soule and H. L. Kleine, St. Louis.—p. 313.
Abdominal Lithopedion Developing from a Twin Pregnancy. J. D. Hayward, St. Louis.—p. 315.
Ice Cream, America's Most Excellent Health Food. W. H. E. Reid, Columbia.—p. 317.
The Soya in Every Hospital and Home. R. H. Monier, Carrollton.—p. 319.
Medical Ethics. O. B. Hall, Warrensburg.—p. 323.
Concerning Heredity in Diabetes. A. Bleyer, St. Louis.—p. 325.

Clinical Appraisal of Water Metabolism.—Glassberg states that the minimal water intake compatible with optimal nutrition is more than 2 quarts (liters) a day in temperate climates; in hot weather or during excessive physical exertion more should be ingested to aid the body in the elimination of heat. If considerably greater amounts of water are required under these circumstances, its value may be enhanced by the addition of table salt in physiologic proportion (2 teaspoonfuls to the quart). The minimal water intake in infectious or toxic states should be 3 quarts a day in the absence of contraindications. There is no physiologic reason for limiting the water ingested with meals or that allowed during the course of a reducing cure. If an obese patient fails to lose weight under adequate management faithfully executed, the cause should be sought in water retained in the tissues. Dehydration treatments for disease should not be inaugurated thoughtlessly, nor should they be continued longer than absolutely necessary.

Pyridium in Gonorrheal Vaginitis in Children.—Brown and his co-workers treated gonorrheal vaginitis in twenty-one children by inserting a vaginal suppository of 0.16 Gm. of pyridium in a boroglyceride of gelatin base every night followed by a 500 cc. cleansing douche. The solution, 1:1,500 potassium permanganate, was given by way of the Dakin tube under low pressure every morning. Under such a regimen the duration of treatment has been reduced gradually so that with a cooperative family the average treatment extends from four to eight weeks.

Nebraska State Medical Journal, Lincoln

19: 281-320 (Aug.) 1934

Clinical Recognition of Acute Coronary Thrombosis. J. B. Herrick, Chicago.—p. 282.
Present Status of Serum Therapy in Pediatrics. J. H. Hess, Chicago.—p. 288.
Some Commonly Misunderstood Features About Cutaneous Cancer. F. D. Weidman, Philadelphia.—p. 295.
Neurology and General Medicine. L. J. Pollock, Chicago.—p. 298.
Effects of Pregnancy and Disease on Each Other. H. Ehrenfest, St. Louis.—p. 304.
Dermatophytosis Down to Date. F. D. Weidman, Philadelphia.—p. 309.
Birth Injuries of the Child. H. Ehrenfest, St. Louis.—p. 313.
Acute Encephalitis and Inflammatory Cerebral Complications as Found in the General Practice of Medicine. H. A. Wigton, Omaha.—p. 316.
Rational Treatment of Encephalitis. G. A. Young, Omaha.—p. 318.

New England Journal of Medicine, Boston

211: 143-188 (July 26) 1934

*Use of Ketogenic Diet in Chronic Pyuria: Preliminary Report. J. M. Rector, San Francisco, and W. E. Wheeler, Boston.—p. 143.
Clinical Basis and Present Status of Vaccination Against Tuberculosis. C. A. Smith, Boston.—p. 147.
Fulminating Streptococcus Infections in Infancy as a Cause of Sudden Death. S. Farber, Boston.—p. 154.
Pyogenic Infections of Bones and Joints in Infancy. W. T. Green, Boston.—p. 159.
Gastro-Intestinal Allergy as Cause of Intestinal Obstruction. D. T. Gallison, Boston.—p. 164.
Cancer of the Pancreas. F. L. Hoffman, Philadelphia.—p. 165.
Resection of the Lower End of the Ulna (Subperiosteal). F. J. Cotton and G. M. Morrison, Boston.—p. 170.
Some Present-Day Conceptions of Phototherapy. F. P. Lowry, Newton, Mass.—p. 171.

Ketogenic Diet in Chronic Pyuria.—Rector and Wheeler treated fourteen cases of chronic urinary tract infection with the ketogenic diet. Practically all the patients had received more or less intensive therapy previously, with little or only temporary benefit. The diet was instituted only in cases that were essentially afebrile. The average duration of the diet was fifteen days. The urine became sterile in eight of the fourteen cases during the course of the dietary treatment and remained sterile for six months (length of follow-up study). In two cases a satisfactory ketosis could not be produced and sterilization was never effected. They showed demonstrable anatomic deformities of the urinary tract. In two other cases the urine was sterile on discharge from the hospital, but the infection recurred later. These two children resumed a normal diet as soon as the cultures became negative. In no case in which the patient was kept on the diet for a week or longer after the cultures became negative has there been a recurrence. In one case, satisfactory ketosis was not attained in the hospital. Later by using a higher ratio diet and by restricting fluids at home, the urine became sterile but the infection recurred four months later. The urine of one patient was sterile on discharge, but he did not return for bacteriologic follow up.

New Jersey Medical Society Journal, Trenton

31: 377-438 (July) 1934

Medical Problems in New Jersey: Study of Contract Practice and Dispensary Abuses. T. K. Lewis, Camden.—p. 383.
Anesthesia from a Surgeon's Point of View. M. Danzis, Newark.—p. 390.
Disease of Coronary Arteries. D. Riesman and S. E. Harris, Philadelphia.—p. 396.
Operative Treatment of Ruptured Duodenal Ulcers. A. S. Harden, Newark.—p. 400.
Gastro-Intestinal Manifestations of Food Allergy. A. F. R. Andresen, Brooklyn.—p. 402.
Anorexia in Children. F. E. Johnson, New York.—p. 408.
Hodgkin's Disease. W. E. Chamberlain and B. R. Young, Philadelphia.—p. 415.
Problems in Medical Diagnosis. A. Stengel, Philadelphia.—p. 417.

New York State Journal of Medicine, New York

34: 621-664 (July 15) 1934

Physical Therapy in a Health Resort. W. S. McClellan, Saratoga Springs.—p. 621.
Personality Make-Up of the Criminal. V. C. Branham, Albany.—p. 626.
Continuous Intravenous Method of Fluid Administration (Venoclysis) in Pediatrics. S. Karelitz, New York.—p. 631.
Clinical Study of Herpes: Review of Fifty-Eight Cases. A. R. McFarland, Rochester.—p. 637.
Management of Placenta Praevia: Analysis of End Results of Fifty-Seven Personal Cases. L. E. Phaneuf, Boston.—p. 641.
Epilepsy of Allergic Origin. T. W. Clarke, Utica.—p. 647.
Program of Division of Cancer Control of New York State Department of Health. B. T. Simpson, Buffalo.—p. 652.

34: 665-706 (Aug. 1) 1934

Prevention of Asphyxia During Anesthesia. P. J. Flagg, New York.—p. 665.
Treatment of Asphyxia in Clinical Disease, with Especial Reference to Recent Developments in the Use of Oxygen in Heart Disease. A. L. Barach, New York.—p. 672.
Lingual Death Zone in Asphyxia. C. Jackson and C. L. Jackson, Philadelphia.—p. 681.
*Clinical Experience with Vitamin D Milks. J. M. Lewis, New York.—p. 685.
Work of the Council on Physical Therapy of the American Medical Association. J. S. Coulter and H. A. Carter, Chicago.—p. 689.
Early Diagnosis of Carcinoma of the Cervix. N. P. Sears, Syracuse.—p. 692.
The Modern Psychiatric Hospital in Relation to Public Health. W. W. Wright, Marcy.—p. 695.

Clinical Experience with Vitamin D Milks.—Lewis discusses the antirachitic value of various types of vitamin D milk. His observations show that vitamin D milks are effective antirachitic agents and require fewer units to prevent or cure rickets than are necessary in the form of cod liver oil or viosterol. In nine rachitic infants 80 units of crystalline vitamin D incorporated in milk brought about definite healing in one month, whereas 80 units dissolved in oil brought about healing in only three of nine rachitic infants during the same period of observation. These results indicate that the medium of milk allows for better absorption or utilization of the antirachitic vitamin and offer an explanation why vitamin D milks as a group require fewer units than cod liver oil or viosterol to prevent or cure infantile rickets. The administration of vitamin D milks to lactating mothers cannot be relied on to prevent rickets in breast-fed infants. Antirachitic agents will have to be given directly to nursing infants in order to protect them against this nutritional disorder. Vitamin D milk might be given with advantage from infancy to adolescence in order to bring about an optimal phosphorus and calcium retention during the growing period.

Philippine Islands Med. Association Journal, Manila

14: 249-288 (July) 1934

Bacterial Variation: So-Called Microbic Dissociation. M. H. Soule, Ann Arbor, Mich.—p. 249.
Food of Inmates of Correctional Institutions for Women. F. O. Santos and N. A. Pidlaoan, Manila.—p. 252.
Importance to Filipinos of Mental Hygiene. J. A. Fernandez, Mandaluyong.—p. 259.
Report on Some Instructive Cases of Heavy Ascariasis. J. Albert and P. H. Paulino, Manila.—p. 269.

Psychiatric Quarterly, Albany, N. Y.

8: 435-650 (July) 1934

Functions of Psychiatry in a Training School for Juvenile Delinquents. C. O. Cheney, New York.—p. 439.
The Physician and His Training in a Public Mental Hospital. A. E. Witzel, Brooklyn.—p. 450.
Palliative Psychotherapy in a Case of Obsessional Neurosis. W. J. Spring, New York.—p. 466.
Colonization as a Therapeutic Measure. H. G. Hubbell, Newark, N. Y.—p. 476.
Retrospective Evaluation of Therapy. H. A. Steckel, Syracuse, N. Y.—p. 489.
Treatment of Problems of Nutrition in Mental Cases. C. L. Wittson, Central Islip, N. Y.—p. 499.
Results of Habit Training. R. E. Herold, Willard, N. Y.—p. 511.
Ego Status in Psychoanalysis. A. Eisendorfer, Manhattan, N. Y.—p. 515.
Amentia in Medical Diagnosis. G. V. N. Dearborn, New York.—p. 525.
Studies of Catatonia: I. Introduction. C. Landis, New York.—p. 535.
Id.: II. Central Control of Cerea Flexibilitas. T. W. Forbes, New York.— p. 538.
Id.: III. Bodily Postures Assumed While Sleeping. P. H. Du Bois and T. W. Forbes, New York.—p. 546.
Hereditary and Environmental Factors in Causation of Dementia Praecox and Manic-Depressive Psychoses. H. M. Pollock, B. Malzberg and R. G. Fuller.—p. 553.

South Carolina Medical Assn. Journal, Greenville

30: 139-156 (July) 1934

Value of Vital Statistics to Public Health Workers. M. B. Woodward, Columbia.—p. 142.
Brain Tumor: Presentation of Case. C. T. Bullock, Columbia.—p. 143.

Texas State Journal of Medicine, Fort Worth

30: 239-302 (Aug.) 1934

Thoracic Actinomycosis: Report of Case of Primary Type. L. P. Good, Texarkana.—p. 245.
Ruptured Esophageal Varices. S. E. Russ, San Antonio.—p. 250.
Skeletal Distraction in Treatment of Fractures of Forearm. C. F. Clayton, Fort Worth.—p. 254.
Radiation Therapy of Malignant Diseases. H. G. F. Edwards, Shreveport, La.—p. 260.
*Are Peptic Ulcers Varicose Ulcers? P. Riddle, Dallas.—p. 267.
Alum Precipitated Toxoid in Diphtheria Prevention. T. J. McElhenney, Austin.—p. 271.
Effect of Irradiation of Hypophysis on Experimental Diabetes. W. A. Selle, J. J. Westra and J. B. Johnson, Galveston.—p. 275.
Diagnosis of Obscure Fevers. S. J. Lewis, Beaumont.—p. 279.
Food Poisoning: Food Infections and Food Intoxications. M. O. Rouse, Dallas.—p. 283.
Methods of Diagnosis in Allergy, Especially Skin Tests and Their Limitations. I. S. Kahn, San Antonio.—p. 286.

Peptic and Varicose Ulcers.—Riddle shows that varicose ulcers of the leg and peptic ulcers have many features in common—their size, shape, chronicity, multiplicity and tendency to heal and reappear in old or new regions. Supportive treatment of varicose ulcers of the leg has been used effectively for many years, treatment being based on the theory that the stagnant blood is pumped back to the heart. Likewise supportive treatment, with the employment of corsets, has been used for many years in treating peptic ulcers, but the satisfactory results obtained were not explained with reference to the varicose theory. The improved condition was thought to result from relief of the splanchnic pull in visceroptotic and neurotic persons. The author observed that bandaging the abdomen with a 3 inch elastic bandage, in a way similar to bandaging the leg, gives great relief in cases of peptic ulcer. He has also used an elastic girdle with good results. He explains this relief on the basis that the stagnant blood is pumped out of the stomach and duodenum back through the liver into the systemic, venous circulation. In this manner a peptic ulcer patient may remain ambulatory. The author has been able to cause varicose ulcers of the leg of a duration of forty years to heal by the proper bandaging and by prescribing the proper amount of exercise. Likewise, a regimen of bandaging the abdomen, sufficient walking along with small, frequent meals that keep the stomach pumping, has given relief not only to peptic ulcer patients who have not been operated on but to those who have been unsuccessfully operated on. The author employed this method of treatment in twelve cases, with much relief in all and complete relief in the majority.

Western J. Surg., Obst. & Gynecology, Portland, Ore.

42: 373-434 (July) 1934

Hernia Into Descending Mesocolon (Left Duodenal Hernia): Its Mechanism; Preliminary Report. C. L. Callander, G. Y. Rusk and Alma Nemir, San Francisco.—p. 373.
Peritoneoscopy. J. C. Ruddock, Los Angeles.—p. 392.
Reticulo-Endothelial System. J. T. Mason, Seattle.—p. 406.
Subcutaneous Bursting of Jejunum. R. Brown, Santa Barbara, Calif.—p. 413.
Treatment of Septic Abortions and Their Complications. J. L. Bubis, Cleveland.—p. 417.

West Virginia Medical Journal, Charleston

30: 289-336 (July) 1934

Infant Mortality Studies in West Virginia. G. M. Lyon, Huntington.—p. 289.
Silicosis. D. N. Barber, Charleston.—p. 310.

30: 337-384 (Aug.) 1934

Obstetric Application of Surgical Progress. J. R. Bloss, Huntington.—p. 337.
Mechanism and Treatment of the Neuroses. I. J. Spear, Baltimore.—p. 342.
Cancer of the Breast. R. J. Wilkinson, Huntington.—p. 348.
Syphilis from the Standpoint of the General Practitioner. T. G. Reed, Charleston.—p. 352.
Prophylaxis of Gallbladder Disease. G. F. Grisinger, Charleston.—p. 357.
Diagnosis and Treatment of Some Conditions Requiring Bronchoscopy. V. A. Williams, Pittsburgh.—p. 358.
Extragenital Chancres. H. T. Phillips and W. J. Morginson, Wheeling.—p. 363.
Hay Fever: Methods of Treatment. L. N. Gay, Baltimore.—p. 366.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Surgery, Bristol

22: 1-200 (July) 1934

Examination of Fresh Tissues by the Wet-Film Method. L. S. Dudgeon and N. R. Barrett.—p. 4.
Reconstruction of the Forearm After Loss of the Radius. R. W. Jones.—p. 23.
Localized Hypertrophic Enteritis as Cause of Intestinal Obstruction: Report of Two Cases. W. A. Jackman.—p. 27.
Gastrojejunal Ulceration. A. J. Walton.—p. 33.
Protrusio Acetabuli (Central Luxation). F. C. Golding.—p. 56.
Bone Graft for Nonunion of the Carpal Scaphoid. G. Murray.—p. 63.
X-Ray Investigation of the Upper Right Quadrant. W. H. Dickson. —p. 69.
*Changes in Blood Sugar Level Associated with Surgical Operations. A. G. Weddell and H. E. D. Gale.—p. 80.
Diverticula of Vermiform Appendix. H. C. Edwards.—p. 88.
*Acute Enteric Intussusception in Adult Caused by Lipoma: Survey of Literature. R. I. Poston.—p. 108.
Cysts of External Cartilage of Knee with Erosion of Head of Tibia. H. A. T. Fairbank and E. I. Lloyd.—p. 115.
Adolescent Kyphosis. J. M. Edelstein.—p. 119.
Enterogenous Cysts. W. E. A. Hughes-Jones.—p. 134.
Origins and Evolution of Colostomy. T. Dinnick.—p. 142.
Relation of Extrinsic Nerves to Functional Activity of Esophagus. G. C. Knight.—p. 155.
Growth of Periosteum in Long Bones. W. T. Warwick and P. Wiles. —p. 169.

Changes in Blood Sugar Level Associated with Surgical Operations.—The blood sugar level associated with surgical operations, Weddell and Gale found, runs parallel with the clinical condition of the patient. Operations on the upper part of the abdomen round the celiac ganglions are more marked in their effect on the blood sugar level than those more remote from this region, irrespective of their duration. If a high blood sugar level is to be avoided, gentle handling is an essential factor in this neighborhood. In patients who appeared comfortable and relatively free from pain on the day following operation, the blood sugar was found to have reached a lower level than in those who were uncomfortable and in pain. The rise in the amount of the blood sugar level depends far more on the nature of the operation than on its duration. A persistently high blood sugar level is a feature to be expected when the patient is not doing well.

Intussusception in Adult Caused by Lipoma.—Poston reports a case of acute enteric intussusception involving only the small intestine and caused by a submucous lipoma in a man aged 52 years. Such a tumor is usually not discovered until it causes symptoms or until a laparotomy is performed for some condition of which it may or may not be the cause. Search for a tumor especially in the proximal intestine should be made in all cases of intussusception occurring after infancy, and, conversely, all benign tumors of the alimentary canal should be removed as being potential causes of intussusception. In this patient the tumor projecting into the lumen of the small intestine was nodular; it was attached by a pedicle of fibrous tissue and on section was pale yellow and firm, spherical and about 2 cm. in diameter. The mesentery was inflamed and there were definite signs of peritonitis. Histologically the tumor was a pure lipoma.

British Medical Journal, London

2: 99-152 (July 21) 1934

Syphilis in Practice. H. MacCormac.—p. 99.
Rheumatism and Its Relation to Arterial Disease and Periarteritis Nodosa. A. V. Neale and A. G. W. Whitfield.—p. 104.
Inflammatory Dislocation of the Atlas. D. C. L. Fitzwilliams.—p. 107.
Gumma of the Brain: Report of Case Treated Surgically. J. E. Paterson and Margaret Leslie.—p. 109.
Cesarean Section: Delivery of Two Hundred and Fifty-Four Day Extra-Uterine Fetus. A. Hosking.—p. 111.
Cutaneous Manifestation of Vitamin A Deficiency. G. P. Goodwin, —p. 113.

East African Medical Journal, Nairobi

11: 105-140 (July) 1934

Social and Health Conditions Among the Jaluo, with Especial Reference to Maternal and Infant Welfare. J. A. Carman and M. A. W. Roberts.—p. 107.
Significance of Color Changes in the African Skin. L. J. A. Loewenthal.—p. 124.

Irish Journal of Medical Science, Dublin

No. **102:** 241-288 (June) 1934

Some Aspects of Suicide. D. A. MacErlean.—p. 241.
Postoperative Pulmonary Complications. E. T. Freeman.—p. 255.
Recent Advances in Blood Typing. G. C. Dockeray.—p. 267.
Surgical Tour in South Germany. A. Chance.—p. 278.

Journal of Anatomy, London

68: 433-584 (July) 1934

Morphology of Fore Brain Arteries, with Especial Reference to Evolution of Basal Ganglions. A. A. Abbie.—p. 433.
Peduncle of Flocculus and Posterior Medullary Velum: Note. T. J. Johnston.—p. 471.
*Gross Anatomy of Lateral Ventricles. A. Torkildsen.—p. 480.
Some Observations on Development of Corpus Striatum of Birds, with Especial Reference to Certain Stages in Common Sparrow (Passer Domesticus). A. Durward.—p. 492.
Position of Nutrient Foramen and Direction of Nutrient Canal in Long Bones of Madder-Fed Pig. C. G. Payton.—p. 500.
Comparison of Joints of Arm and Leg and Significance of Structural Differences Between Them. C. P. Martin.—p. 511.
Cervical Intercostal Articulation. A. J. E. Cave.—p. 521.
Development of External Ear. F. Wood-Jones and W. I-Chuan.—p. 525.
Comparative Study of Anterior Cerebral Artery and Circle of Willis in Primates. J. W. Watts.—p. 534.
Absence of Right Common Carotid Artery. J. D. Boyd.—p. 551.
Neopallium of Ox: Study of Its Development and Interpretation of Its Convolutions. R. Anthony and J. de Grzybowski.—p. 558.

Gross Anatomy of Lateral Ventricles.—Realizing that the anatomy of the ventricles in a living brain is somewhat different from that seen at dissection or as a result of injection, Torkildsen correlated casts and dissections of the brain with the roentgenologic pictures of the ventricles after the cerebrospinal fluid has been exchanged for air. He used eleven brains from adults, the patients having died of diseases not connected with the central nervous system. He studied a group of 450 selected sets of ventriculograms and encephalograms and from these he selected thirteen sets, because they illustrated particularly what he considered to be a normal ventricular system. He found that the results of the examination by the two methods correspond well but show that a certain amount of collapse takes place in the preparation of the brains. The lateral ventricles vary to a certain extent in size and form. The greatest variation has been found in the posterior horns, in which the calcarine fissure at times seems to cause obliteration. The posterior horns are not constantly present, and a unilateral absence of a posterior horn can be seen in normal cases. The rest of the lateral ventricle is constantly present but varies within certain limits in size according to the size of the skull and age of the patient. Concerning the form of the lateral ventricles, it has been found that there are normally certain variations of the posterior part of the body. The investigations show that certain of the pictures and casts, which previously have been supposed to represent the normal ventricles, illustrate a moderate degree of hydrocephalus.

Lancet, London

2: 117-176 (July 21) 1934

Viruses in Relation to Etiology of Tumors. C. H. Andrewes.—p. 117.
*Value of Aerocystography. N. Ross.—p. 124.
Lead Poisoning in Children: Case Record. T. S. Rodgers, J. R. S. Peck and M. H. Jupe.—p. 129.
Fractures of the Neck of the Femur. B. McFarland.—p. 133.
Radiographic Evidence of Live Birth. M. Hajkis.—p. 134.
Renal Dwarfism Associated with Calcification of Arteries and Skin. R. Platt and T. K. Owen.—p. 135.
Bilateral Spontaneous Pneumothorax: Report of Case. S. R. Wilson. —p. 136.
Lymphogranuloma Inguinale Acquired in England. K. V. Earle.—p. 137.
Impedance Angle of the Human Body. E. R. Holiday and F. C. Smith.—p. 139.

Aerocystography.—Ross confirms the value of aerocystography as an aid to diagnosis of intravesical enlargement of the prostate. The disadvantages of cystoscopy in certain cases are reiterated and the simplicity of the air-in-bladder technic is noted. The interpretation of a prostatic shadow is clarified, and the ease with which distinction between simple and malignant prostates may be made is emphasized. New growths of the bladder are also visualized by this procedure and an attempt is made to correlate the aerocystographic appearances (corresponding to the morbid anatomy) with the histologic anatomy of these neoplasms. Reference is made to "median bar" formation, and diagnosis by aerocystography in certain types (trigonal

bars) is described. Cystoscopy is a preferable means of diagnosis in the meatal bar. The existence of median bars should be more widely known.

Medical Journal of Australia, Sydney

2: 37-64 (July 14) 1934

Migraine. G. H. B. Black.—p. 37.
Disorders of the Menopause. J. M. Buchanan.—p. 46.
*Pathogenicity of Yeastlike Fungi. J. I. Connor and Margot McKie. —p. 52.

2: 65-104 (July 21) 1934

Clinical Diagnosis and Postmortem Findings in Malignant Disease. J. B. Cleland.—p. 65.
Use of Radon at the Adelaide Hospital. B. S. Hanson.—p. 71.
Venoms of Some of the Small and Rare Australian Venomous Snakes. C. H. Kellaway.—p. 74.

Pathogenicity of Yeastlike Fungi.—While investigating the pathology of paronychia and intertrigo, Connor and McKie isolated, in addition to those strains of Monilia albicans reported, several strains of yeastlike organisms which differ from Monilia albicans in pathogenicity for rabbits and in fermentative reactions. These appear to be the cause of the inflammatory condition from which they were isolated. The strains studied fall into three groups. Group 1 includes typical Monilia albicans from paronychia. Group 2 includes one type culture from a laboratory and one strain, number 10, isolated from a chronic inflammatory patch on the sole of the foot. Group 3 includes two strains isolated from the web of toes, one from an interdigital lesion and one from a blood culture. Strains from groups 2 and 3 were nonpathogenic for rabbits and formed acid only in maltose and saccharose. Group 2 formed no mycelium in vitro, though delicate mycelium was present in epithelium of the lesion of origin in the case of strain 10, group 2. Group 3 formed typical mycelium in 1 per cent dextrose agar stab and slide cultures.

Practitioner, London

133: 1-128 (July) 1934

Some Common "Functional" Disorders. E. Bramwell.—p. 1.
Prognosis and Treatment of Chronic Epidemic Encephalitis. A. J. Hall.—p. 26.
Epilepsy and Its Treatment. J. Collier.—p. 37.
Mechanism and Treatment of Migraine. M. Critchley.—p. 54.
Hemiplegia. A. Feiling.—p. 62.
Paraplegia. O. H. Gotch.—p. 76.
Treatment of Syphilis of the Nervous System. R. Lees.—p. 85.
Concussion and Its Treatment. L. R. Broster.—p. 93.
Significance of Wasting of the Upper Extremity in Diagnosis of Nervous Diseases. J. St. C. Elkington.—p. 101.
Medicolegal Problems in General Practice: VII. Laboratory Examination of Exhibits in Criminal Cases. J. Glaister.—p. 113.

Quart. Bull., Health Org., League of Nations, Geneva

3: 157-324 (June) 1934

Reclamation of Pontine Marshes. A. Ilvento.—p. 157.
Natural Transmission of Mediterranean Leishmaniasis. L. Parrot. —p. 202.
Recent Tendencies in Development of General Hospitals in England. M. D. Mackenzie.—p. 220.
Participation of the Public Health Service in the Civil Works Program for Relief of Unemployment in the United States of America. H. S. Cumming.—p. 289.
Fly Free Manure Heaps. Edm. and Et. Sergent.—p. 299.
Fly Control in Denmark. M. Thomsen.—p. 304.

Journal of Oriental Medicine, South Manchuria

20: 69-78 (June) 1934

Cow's Milk in Manchuria and Mongolia: Part I. Chemical Constitution. M. Sugiura.—p. 69.
Id.: Part II. Inorganic Components. M. Sugiura.—p. 71.
Refining Toxin of Absorption Method of Hydroxide of Aluminum: II. Toxin of So-Called Streptococcus Hemolyticus Scarlatina. M. Yato. —p. 72.
Diet Nutrition of Chinese in Manchuria: II. Actual Food Consumption and Average Diet in Manchuria. T. H. Lu.—p. 73.
Biologic Studies of Rays: II. Influence on Body Temperature and Their Mechanical Processes. T. Kodama, B. Tanaka and S. Suzuki. —p. 75.
Researches on Calculus of Bladder from Chemical and Roentgenologic Point of View. M. Murayama.—p. 76.
Influence of Injection of Pregnancy Urine on General Growth and Development of Various Organs in New-Born Rabbits. Y. Matsuura. —p. 77.
Standardization of Scarlet Fever Antitoxin: Employing the Ears of White Rabbits and Skin Reaction of Rabbits of Special Breeds (Chinchilla and Angora). S. Nagata.—p. 78.

Archives des Maladies du Cœur, Paris

27: 389-452 (July) 1934

*Clinical Study of Gallop Rhythm. D. Routier and A. Van Bogaert. —p. 389.
Intermittent Nodal Rhythm in Course of Scarlet Fever: Case. P. Duchosal and F. Sciclounoff.—p. 409.
Cardiovascular Syphilis with Hemiplegia in Child, Aged 3. V. Mikulowski.—p. 417.

Gallop Rhythm.—Routier and Van Bogaert studied the heart with gallop rhythm by means of simultaneous electrocardiograms and apical cardiograms. Instead of the usual Marey button employed in cardiography, the authors preferred a pneumatic cuff. The result differed from that in which Marey's button was used in that the phase of systolic emptying tends to become negative immediately after the initial positive rise. An inverted tracing is thus not obtained. Three characteristics accompany presystolic gallop with such frequency that they serve to authenticate and determine exactly the mechanism. These three, which were studied in detail, are exaggerations of the auricular wave, lengthening of the a-c interval (the time separating the beginning of auricular systole and that of ventricular systole in the cardiogram), and shortening of ventricular systole. More than 100 cases were studied. The presystolic wave was particularly clear in 97 per cent of the cases of gallop, more so than in the normal cardiogram. This enlargement is manifested sometimes by shortening of the P-a interval, sometimes by lengthening of the a-c interval. Lengthening of the a-c interval is frequent in gallop rhythm and was found in 14 per cent of the cases of lengthening of the time of auriculoventricular conduction. In 48 per cent of the cases of a-c lengthening it was independent of auriculoventricular conduction. It refers, therefore, to a retardation of ventricular contraction on the excitation received. Exceptionally, the systole is shortened in gallop rhythm. The term "brachysystole" designates auscultatory shortening of the systole and corresponds to the infrequent case in which the tracing demonstrates this shortening.

Gynécologie et Obstétrique, Paris

29: 497-604 (June) 1934

Malignant Tumors of Ovary and Puerperium. P. Trillat and A. Puthod. —p. 513.
*Morphologic and Functional Value of Intravenous Urography for Urogenital Fistulas. W. Dobrzaniecki and W. Grabowski.—p. 526.
Intestinal Infarct in Eighth Month of Pregnancy: Case. A. Gingllinger.—p. 538.
Bordet Gengou Reaction in Gynecology. A. S. Jarkovskaya.—p. 542.

Intravenous Urography for Urogenital Fistulas.—Some cases of unexpected complications in the course of operations for urogenital fistulas and some postoperative complications led Dobrzaniecki and Grabowski to investigate more exactly and more minutely the urinary apparatus. For this purpose intravenous urography with iopax was employed. Their clinical and urographic observations did not exceed ten cases. All the fistulas were obstetric and resulted from hard labor and appeared either immediately after labor or several days later at the moment of elimination of the slough. In one of their cases, forceps caused a fistula. As a result of their studies it was clear that almost half the patients with fistula are subject to a more or less accentuated disorder of the urinary apparatus, which may be discovered with precision by means of intravenous urography.

Lyon Chirurgical

31: 389-520 (July-Aug.) 1934

*Pathogenesis of Arterial Hypotension in Spinal Anesthesia. C. Angelesco and G. Buzoianu.—p. 389.
*Treatment of Hydatid Cysts of Liver Ruptured into Biliary Tract. G. Carayannopoulos.—p. 415.
Intramammary Angioma. E. Dahl-Iversen.—p. 431.
Intracranial Pneumatocele with Personal Observation. E. Lucinesco and N. Falcoianu.—p. 439.

Arterial Hypotension in Spinal Anesthesia.—Angelesco and Buzoianu state that the hypotensive action of spinal anesthesia depends on several factors of direct or indirect nature, such as the anesthetic substance, the quantity of anesthetic introduced, the level of spinal injection, the diffusibility of the anesthetic liquid with the spinal fluid, and the preexisting condition of the arterial tension. The primary element deter-

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mining the spinal anesthetic hypotensive mechanism is the neurovegetative system. The cause of vascular hypotension during and after spinal anesthesia is vegetative hypo-amphotony, predominently sympathetic, which depends on the anesthesia of the medullated nervous elements forming consequently an integral part of the anesthesia. Spinal anesthesia not only paralyzes the motor elements controlling muscular contraction or the sensory elements of the medulla but also paralyzes in different degrees the functions of the vagosympathetic vegetative medullary centers. The variability of the hypotension, conditions of intraspinal injection being equal, depends fundamentally on the variable state of vegetative equilibrium in different patients. The important problem is to find a substance which, injected intraspinally, can have two primary effects, anesthesia and motor paralysis, but without paralytic effects on the vegetative centers of the medulla. Up to the present, neutralization of the latter effects is all that can be done. For this purpose ephedrine is satisfactory.

Hydatid Cysts of Liver.—Carayannopoulos performed a two stage operation on some of his patients with hydatid cysts rupturing into the biliary tract. This consisted first in attacking the cyst and in a second trial attempting to free the obstruction of the biliary passage. In some patients this order was reversed. He concludes that in the majority of cases in which hydatid cysts of the liver rupture into the biliary tract a combined operation in one or two stages to open the cyst and drain the biliary tract is necessary. Simple drainage of the principal passage with simple marsupialization also effects a number of cures, but especially in cases of infection the combined method is to be preferred.

Presse Médicale, Paris

42: 1049-1064 (June 30) 1934

*Obstruction of Bile Duct by Adenopathies. M. Brulé and J. David.—p. 1049.
Traumatism of Thorax and Pulmonary Tuberculosis. N.-N. Stoichitza.—p. 1051.
Treatment of Traumatic Suppurative Arthritis of Instep. J. Patel and C. Adamesteanu.—p. 1052.
Cancer Problem. Juster and Caillau.—p. 1054.
Localized Meningitis. I. David-Galatz and R. David.—p. 1057.

Obstruction of Bile Duct by Adenopathies.—Brulé and David call attention to a group of cases in which signs of obstruction of the bile duct are the only manifestation of localized adenopathy. These adenopathies are of various nature. They are frequently tuberculous, they may complicate general infections or local inflammations, or they may be primary of indeterminate nature. The rapid recession of icterus after removal of such enlarged glands proves to the authors' satisfaction that the adenopathies are the only cause of biliary obstruction and that the biliary retention is purely mechanical.

Policlinico, Rome

41: 1043-1082 (July 9) 1934. Practical Section

Modern Trends in Treatment of Nephropathies. V. Serra.—p. 1043.
*Areas of Epigastric Pain in Diseases of Stomach. G. Pieri.—p. 1051.
Abdominal Fistula Due to Foreign Body. G. Rizzo.—p. 1056.

Epigastric Pain in Diseases of the Stomach.—Pieri studied the sites of maximal epigastric pain on pressure in 504 gastric patients who had postoperative peptic ulcers, gastric ulcer, juxtapyloric ulcer, concomitant gastric and duodenal ulcer and epithelioma. The author maintains that these conditions present a constant topography of pain. In ulcers, circumscribed areas of pain are constantly observed on pressure according to the type of ulcer. In gastric ulcer of the small curvature the pain is localized at the gastric site; in juxtapyloric ulcer, at the pyloric duodenal point. The author states that the study of the sites of epigastric pain is no means of determining the possible origin of a gastric epithelioma due to a preexisting benign ulcer of the stomach. In chronic gastritis there is usually pain on pressure limited to the upper part of the epigastrium with variable areas of maximal intensity. In 100 cases of gastric neurosis, twenty-four showed pain neurosis, fifty-nine asthenic neurosis and seventeen hypersthenic neurosis. In pain of a neurosis the greatest tenderness was at the celiac point; in asthenic forms of neurosis it was inconstant and occurred at various points, while in hypersthenic neurosis pain was constantly localized at the epigastric angle, frequently associated with pain at the site of duodenopyloric junction. These points of pain (celiac, medio-epigastric, gastric, duodenopyloric and gastrojejunal) have been observed by the author in individual cases of gastric disease. He concludes that the appearance of individual areas of pain may represent a valuable sign not to be overlooked in the diagnosis of some gastropathies and especially in ulcer.

41: 341-392 (July 15) 1934. Surgical Section

Tumors of Tendon Sheaths. M. Canavero.—p. 341.
*Means Taken to Impede Regeneration of Periosteum After Costal Resection in Thoracoplasty. N. Di Paola.—p. 361.
*Relation of Sclerodermia to Calcium Metabolism. B. Paggi.—p. 371.
Splenic Anemia: Late Results of Splenectomy. A. Zagami.—p. 384.

Regeneration of Periosteum After Costal Resection in Thoracoplasty.—Di Paola found that the use of the thermocautery in rabbit experimentation delays regeneration of the periosteum. Yet it always presents the danger of destroying the underlying pleura and giving pleural reactions leading to serious complications. He states that, although the thermocautery has been effective, it has no practical value. He was able to impede the regeneration of the rib bone with a silver nitrate pencil. The silver nitrate showed itself to be energetic; in fact its caustic action extended up to the pleura, causing a pleural reaction which was well tolerated by the rabbits up to the time of their death, 100 days after operation. Muller's fluid was totally unable to stop the regeneration of the bone in the costal periosteum. A strong solution of formaldehyde, 15 or 20 per cent, applied for a few minutes responded completely to the purpose. Besides the fact that it impedes the regeneration of the bone, it does not harm the pleura.

Relation of Sclerodermia to Calcium Metabolism.—Paggi studied a patient presenting diffuse sclerodermia with symptoms of diffusion of the sclerotic process to the deep connective tissues. In addition, the patient showed typical signs of deforming arthritis. The calcemia and hypophosphoremia were normal. The calcium metabolism showed a daily retention of calcium equal to 1.401 Gm. The urine showed a marked deficiency in calcium. An operation was performed for hyperparathyroidism and a ligature was put on the lower right parathyroid. The patient showed rapid improvement and the calcemia was still normal. The author performed a second operation in which he tied off the two parathyroids on the left. Signs of slight hypoparathyroidism were observed. The calcemia and phosphoremia showed a diminution below normal. The chronaxia was also markedly diminished. The calcium metabolism did not show a significant decrease; the daily retention of calcium came to 1.365 Gm. Seventeen days after the second operation the patient was given daily injections of parathyroid extract-Collip for twelve consecutive days in doses of from 20 to 40 units. The calcemia rose to 0.110 Gm. per thousand after the twelve days. The calcium metabolism was decreased to 0.051 Gm. and the chronaxia returned to normal. The author concludes that the therapeutic value of parathyroidectomy in sclerodermia requires confirmation, that the study of calcium and phosphorus metabolism did not demonstrate changes due to hyperparathyroidism, that treatment with parathyroid extract-Collip does not show beneficial results and that during the period of slight hypoparathyroidism the chronaxia diminishes under the influence of parathyroid extract-Collip but gradually rises to normal.

Riforma Medica, Naples

50: 877-916 (June 9) 1934

Physiopathology of Suprarenal Cortex. S. De Candia.—p. 879.
Use of Sensitizing Power of Chlorophyll in Actinic Treatment of Alopecia Areata. A. Versari.—p. 886.
*Oculopharyngeal Reflex. A. P. Di Sorrentino.—p. 891.

Oculopharyngeal Reflex.—Di Sorrentino studied the reflex in a number of patients at the moment of instillation of a medical solution in the conjunctival sac. The reflex consists in a movement of rapid deglutition together with a spontaneous closing of the eyes. The swallowing is not associated with the contraction of the orbicularis muscle of the eyelid. The reflex was found only in a small number of patients, most of whom were children from several months to 13 years of age. The presence or absence of an ocular disease has no influence on the positivity of the sign. The author found that the chemical composition of the substances instilled in the

conjunctival sac likewise had no influence on the reflex. The sign may be produced by touching the bulbar conjunctiva with a common glass spatula. The temperature of the stimulating factor, whether liquid or spatula, is important. The stimulation is greater at lower temperatures than at average or relatively high temperatures. The sections of the stimulated conjunctiva (nasal or temporal) are not significant; only the bulbar part is more sensitive than the palpebral. The few adults demonstrating the reflex showed signs of an extremely parasympatheticosthenic condition and of marked hypothyroidism. The author interprets it as a reflex of predominantly vagotonic constitutions. Most cases show a constant hypotonia of the endocrine sympathetic system with a prevalence of the parasympathetic section. The author states in conclusion that the nervous path followed by the centripetal stimulus is the trigeminal, while the centrifugal path taken by the motor impulse is represented by the nerves of deglutition.

Archiv für Gynäkologie, Berlin

157: 139-274 (June 25) 1934

*Clinical Aspects of Eclampsia. E. Fauvet.—p. 139.
Cystadenoma of Wolffian Duct. H. Dworzak.—p. 162.
Virilizing Ovarian Tumor (Ovarian Arrhenoblastoma). Z. von Szathmáry.—p. 170.
Function of Thyroid of the New-Born and Congenital Goiter. W. Neuweiler.—p. 187.
*Roentgenologic Diagnosis of Intra-Uterine Death of Fetus. O. Brakemann.—p. 197.
*Value of Flocculation Reactions for Demonstration of Syphilis During Pregnancy. L. Kolbe and A. Székács.—p. 214.
Ovarian Function After Extirpation of Uterus. H. Siegmund.—p. 223.
Function of Autoplastically Transplanted Pieces of Uterine Wall into Anterior Chamber of Eye of Rabbits. H. Dworzak and K. Podleschka.—p. 229.
Extra-Uterine Twin Pregnancy. K. Podleschka.—p. 250.
Comparative Studies on Pregnancy Changes in Suprarenals. E. Kulka.—p. 259.
Hemolytic Methemoglobin Formation in "Eclampsia Without Convulsions." W. Spitzer.—p. 267.

Clinical Aspects of Eclampsia.—Fauvet reviews several opinions about the nature of eclampsia and discusses eight cases. He concludes that the disorder described by Batisweiler, and designated by Fahr as diffuse exudative nephritis, is not always present in case of premature detachment of the correctly placed placenta. He thinks that this disorder develops secondarily in the course of the renal disorder of pregnancy. It may terminate fatally with the clinical signs of renal insufficiency. In two of the cases described by the author, the maximum of urinary elimination, together with pathologically increased blood pressure values, did not develop until about a week after delivery. He thinks that this manifestation is connected with the secondary inflammatory edema of the kidneys and he assumes that, as a result of the compression of the parenchyma, the secretory action of the kidney may be reduced to complete anuria. The organism overcomes the renal compression by a compensatory hypertension. If this regulatory action fails, the administration of fluid in the form of osmotherapy may be a life saving measure. However, this treatment is successful only if its prerequisites are fulfilled: threatening anuria as the result of inflammatory or noninflammatory edema of the kidney and lack of compensatory hypertension. In circulatory insufficiency the treatment is not advisable. The author discusses the cause of hypertension developing during the later period of the puerperium. He thinks that it is due to hormone action of the hypophysis-interbrain system and considers the possibility of the development of late eclampsia.

Diagnosis of Death of Fetus.—Brakemann emphasizes that the position of the mother during roentgenoscopy is of vital importance for the recognition of changes in the cranium and the vertebral column of the fetus. He shows that roentgenoscopy, while the mother is lying on her stomach, discloses the typical changes in the cranium of the dead fetus in only a certain percentage of the cases. It fails completely in a considerable number of cases, even if the fetus has been dead for some time and there is severe maceration. The characteristic sign in the vertebral column likewise is often missing if roentgenoscopy is done while the mother is in the same position. Fetuses that have died in the position of pelvic presentation frequently show neither the cranial nor the vertebral signs. The lack of the vertebral symptom is due to the abnormal pressure conditions in the uterus, produced by the abdominal position of the mother during roentgenoscopy. This pressure produces an artificial stretching of the fetus. If roentgenoscopy is done while the mother is standing up, these purely external, mechanical influences are eliminated and the typical signs may become roentgenologically demonstrable. Control roentgen exposures of the living fetus while the mother is standing up provide the measure for the diagnostic evalution of the changes in the dead fetus. The author admits that it is not to be expected that roentgenoscopy in the standing position will always reveal the intra-uterine death of the fetus; however, it gives certain prospects for clearing up the diagnosis in cases in which the roentgenogram made while the mother is lying on her stomach does not reveal the typical changes.

Demonstration of Syphilis During Pregnancy.—A comparison of the results of the Wassermann reaction with those of the Kiss and Kahn reactions revealed to Kolbe and Székács that the two latter reactions are well suited for the examination of pregnant and puerperal women. The tests permit the detection of a latent syphilis more frequently than does the Wassermann reaction. In regard to the specificity they are somewhat inferior to the Wassermann reaction, but as far as sensitivity is concerned they surpass the Wassermann reaction greatly. The technic of these tests is simple and they can be completed in a comparatively short time. They may serve as controls for the Wassermann reaction but may also be used alone, particularly after a thorough anamnesis has been taken and following a careful observation of the symptoms after birth, and when the tests are repeated several times during the puerperium.

Deutsche medizinische Wochenschrift, Leipzig

60: 1075-1118 (July 20) 1934. Partial Index

Palliative Treatment of Cancer. P. Clairmont.—p. 1080.
Pseudoconfigurations of Heart: Disorders of Extracardiac Origin Simulating Cardiac Defects on Roentgen Screen or in Roentgenogram. W. Löffler.—p. 1083.
Significance of Roentgen Procedure for Therapy and Prognosis of Pulmonary Tuberculosis. H. Stöcklin.—p. 1086.
*Differential Diagnosis of Silicotuberculosis. E. Uehlinger.—p. 1088.
Criticism and Roentgenkymographic Control of Mechanical Respiratory Theories. H. H. Weber.—p. 1091.
Remarks on Roentgen Diagnosis in Orthopedics. R. Scherb.—p. 1095.
Clinical Aspects and Roentgenology of Inconstant Skeletal Elements of Foot. M. R. Francillon.—p. 1097.
Roentgenologic Demonstration of Metal Splinters in Eye Without Interference of Skeletal Parts. A. Vogt.—p. 1100.
*Clinical and Experimental Observations on Cataracts Caused by Rays. H. Schläpfer.—p. 1101.

Differential Diagnosis of Silicotuberculosis.—Uehlinger gives the histories and postmortem histologic reports of two patients. The lung of the first one showed, in addition to the miliary, caseous pneumonias and the scattered, centrally caseated tubercles, many typical silicotic nodules. The sections showed that the tuberculous foci usually adhere to the flame-shaped or roundish silicotic nodules. In the second patient the postmortem examination revealed a combination of silicosis and tuberculosis in such a manner that the clinical manifestations (emaciation, attacks of fever, dyspnea, and so on) were primarily caused by the tuberculous pericarditis and hematogenous tuberculosis of the kidneys and the suprarenals, while the small foci appearing in the thoracic roentgenogram were primarily caused by the silicosis. The author calls attention to the difficulties encountered in the roentgenologic differentiation between silicosis, tuberculosis and silicotuberculosis. He maintains that asymmetry of the pulmonary lesions indicates tuberculosis only in case of bronchogenous and not of hematogenous forms. In mixed cases of tuberculosis and silicosis the localization rules (tuberculosis: site of predilection the upper lobes; silicosis: the middle lobes) are often broken. It should not be overlooked in these combined cases that the pulmonary roentgenogram may reveal silicotic changes, while the clinical manifestations are caused by extrapulmonary tuberculous foci.

Cataracts Caused by Rays.—In discussing the pathogenesis of glassblower's cataract, Schläpfer points out that some investigators ascribe it to ultrared rays, while others ascribe it to ultraviolet rays. At first the experimental production of cataract by ultrared rays encountered certain difficulties, but now animal experiments have proved that glassblower's cataract

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may be imitated to a certain extent by the application of penetrating ultrared rays. The author concludes from this that the eyes of glassblowers should be protected against the ultrared rays by special glasses. Since solutions of ferrous oxide absorb the ultrared rays, he suggests ferrous oxide glasses and states that these glasses are now in use in certain glass factories. Cobalt glasses likewise furnish protection but are undesirable because they impair the capacity for color differentiation. The author reviews clinical and experimental observations, which indicate the possibility that roentgen rays may cause cataract, and consequently he advises against roentgen treatment of disorders in the region of the eye.

Klinische Wochenschrift, Berlin

13: 1041-1072 (July 21) 1934

Electrostructure of Liver and Bile. R. Keller.—p. 1041.
Studies in Glycine Electrophoresis in Progressive Muscular Dystrophy. H. Rutenbeck.—p. 1044.
Lipoid Chemical Studies on Xanthous Lymphogranulomatosis in Its Relation to Hand's Disease. E. Letterer.—p. 1046.
*Hypophyseal Regulatory Mechanism in Carbohydrate Metabolism and Its Impairment in Diabetes Mellitus: Carbohydrate Metabolism Hormone of Anterior Lobe of Hypophysis. K. J. Anselmino and F. Hoffmann.—p. 1048.
*Separate Modifiability of Liver Glycogen and of Blood Ketone Bodies by Carbohydrate Metabolism Hormone and Fat Metabolism Hormone of Anterior Lobe of Hypophysis. K. J. Anselmino and F. Hoffmann.—p. 1052.
*New Method for Determination of Value of Viscidity of Leukocytes. A. Ebergenyi.—p. 1053.
Atoxyl Resistant Lipase in Serum Following Gastric Resection. G. Jorns.—p. 1054.
Autoregulation of Fat Metabolism. S. Leites.—p. 1056.

Hypophyseal Regulatory Mechanism in Carbohydrate Metabolism.—Anselmino and Hoffmann state that following a carbohydrate tolerance test there appears in the blood of healthy persons a substance capable of reducing, in the course of several hours, the glycogen in the liver of rats. The substance is present neither in the blood of fasting persons nor in the blood following tolerance tests with fat or protein. Since the anterior lobe of the hypophysis contains a substance that has the same action on the glycogen content of the liver of rats and which, as far as can be determined, has also the same physical and chemical properties as has the substance found in the blood, it is assumed that the two substances are identical. This assumption was corroborated on hypophysectomized dogs, for, in contradistinction to normal animals, the substance did not appear in their blood after a sugar tolerance test. From the regulatory elimination of the substance following intake of larger quantities of sugar the authors conclude that the process is a hypophyseal regulatory mechanism of the carbohydrate metabolism, resembling that of the fat metabolism, which they identified previously. They designate the active principle as the hormone of the carbohydrate metabolism, which originates in the anterior lobe of the hypophysis, for investigations revealed that it is identical with none of the other anterior hypophyseal hormones. The authors further made tests on eight patients with diabetes mellitus and found that the blood of the fasting diabetic patients contains the hypophyseal hormones of the carbohydrate and of the fat metabolisms in high concentration. This seems to prove a serious disturbance in the hypophyseal regulatory mechanism of patients with diabetes mellitus.

Hypophyseal Hormones of Carbohydrate Metabolism and Fat Metabolism.—Anselmino and Hoffmann describe a method permitting with simple means the separation of the hypophyseal fat metabolism hormone and carbohydrate metabolism hormone. The method takes advantage of the fact that, although both hormones are ultrafiltrable in the neutral reaction, they lose their ultrafiltrability in certain p_H values. It was possible to influence with the separated hormones the hepatic glycogen and the ketone bodies in the blood of rats independent of each other. The purified hypophyseal hormone of the fat metabolism increases the ketone bodies in the blood without influencing the liver glycogen. The purified hypophyseal hormone of the carbohydrate metabolism reduces the glycogen content of the liver without increasing the ketone bodies in the blood.

Determination of Viscidity of Leukocytes.—Ebergényi suggests a new method for the determination of the viscidity of the leukocytes. He asserts that it is not only simpler but also avoids certain errors of the original method of Philipsborn. He describes the procedure in detail and stresses as one of its advantages that it dispenses with the use of the rather expensive grated ocular and uses instead Bürker's chamber. If the drop method is used, a mathematical reduction is employed; but the author considers the immersion method superior. In the latter procedure, the leukocytes can be seen in a larger area and are more evenly distributed. The larger immersion surface of the glass platelet makes possible a better elimination of the unevennesses in the adhesion, which may be caused by impurities. Moreover, the irregular density in the adhesion and the sporadic accumulations, which are occasionally noticed in the immersion procedure, prove that in the viscidity of the leukocytes not only differences in numbers play a part but also that there are differences in arrangement. For the observation of this phenomenon of the leukocytes the immersion method is more suitable than the drop preparation.

Medizinische Klinik, Berlin

30: 921-952 (July 13) 1934. Partial Index

Present Status of Treatment of Exophthalmic Goiter. W. Redisch.—p. 927.
*Indications for Treatment by Jejunal Tube in Case of Gastric Ulcer. B. Misske and H. G. Scholtz.—p. 931.
*Clinical Aspects of Hydatidiform Mole. S. Sommer.—p. 932.
Colposcopy or Autovaginoscopy? H. Rogge.—p. 935.
Idem. E. Bergmann.—p. 937.
Disease and Death Following Bronchography. F. Lickint and Hippe.—p. 937.
Observations on Immunity on Basis of Studies on Malaria. E. Martini.—p. 939.

Treatment by Jejunal Tube in Gastric Ulcer.—Misske and Scholtz state that the treatment by means of the jejunal tube in its present form goes back to Hemming, who took up Einhorn's thought of feeding by means of the duodenal tube. Hemming recommends as the most suitable method the introduction of the tube through the nose. While the patient is lying on the right side, the tube is introduced slowly in the course of a day. The length of the tube is 130 cm. Instead of the rather thick and stiff duodenal tube, the use of a thin elastic rubber tube is recommended. At the end of the tube is an olive of new silver. One of the authors (Scholtz) employed the treatment in thirty-five cases. He found the treatment especially helpful in ulcers of the small curvature. Even deep ulcers of the small curvature yielded to the treatment, as did also rather large ulcers near the cardia. If the tube is in the right position, pain tends to disappear without the use of atropine. In patients with a labile sympathetic nervous system, the injection of the nutritive fluid may at first be accompanied by difficulties; but these disorders are caused by sympathetic reflexes and do not necessitate the removal of the tube, if the fluid is at first given in small quantities and slowly. If the disorders persist in spite of this, atropine or a few drops of tincture of opium may be given. Jejunal catarrh is extremely rare in the course of this treatment. Feeding with the jejunal tube is not satisfactory in duodenal ulcers: improvements are not so convincing and it probably does not accomplish more than the ordinary dietary treatment. The authors think that in these cases the tube may even cause an irritation. As a rule it will be easier to carry out the treatment if several patients undergo it at the same time. On the other hand, the treatment is still rather difficult and should be resorted to only if the niche of the ulcer is quite deep, when other treatments are of no avail. The authors give the history of a patient in whom an unusually large niche of the small curvature was nearly entirely obliterated in the course of thirty-five days of treatment with the jejunal tube. They are convinced that no other treatment would have accomplished this in such a short time, because the ulcer had proved refractory to dietary and medicinal treatments for several years. Surgical treatment was inadvisable because of the extent and location of the ulcer. The authors do not recommend feeding by means of the jejunal tube for all gastric ulcers but think it advisable particularly for deep ulcers of the small curvature.

Clinical Aspects of Hydatidiform Mole.—In the years 1923-1932, Sommer observed twenty-two cases of hydatidiform mole in 18,000 deliveries, an incidence of about 1.2 per thousand. Older women seem to have a greater predisposition for this disorder, as the possibilities for the development of a

hydatidiform mole seem to increase with an increasing number of births. Cystic degeneration of the ovaries was found in 50 per cent of the women who developed hydatidiform mole. Excessive elimination of the mammary secretion, a symptom considered by Winter characteristic for hydatidiform mole, was observed in two thirds of the cases. The simultaneous occurrence of myoma and hydatidiform mole was noted in 20 per cent. The incidence of malignant degeneration was 4.5 per cent, compared to 16 per cent in other statistics. The author ascribes this difference to the fact that in his material extirpation of the uterus was done in all the older women. In the cases in which a conservative treatment was employed and which had to be kept under constant observation, the Aschheim-Zondek reaction proved helpful. He thinks that an exploratory curettage should be done as soon as abnormal hemorrhages and other suggestive signs appear.

Wiener klinische Wochenschrift, Vienna

47: 897-928 (July 20) 1934. Partial Index

*Bacterial Etiology of Enteral Disturbances During Nursling Age and in Later Childhood. K. Hassmann.—p. 904.
*Demonstration of Tubercle Bacilli in Blood. B. Busson.—p. 909.
Estimation of Resistance of Patient Before Surgical Intervention. W. Richter.—p. 910.
*Vomiting of Blood in Tumors of Liver. A. Beer.—p. 911.

Etiology of Enteral Disturbances in Children.—Hassmann succeeded in demonstrating the presence of paracolon bacilli in a large number of nurslings and children who had enteral disturbances (dyspepsia, toxicosis, pyuria, icterus simplex). The paracolon bacilli were especially frequent in the children with relapsing intestinal disturbances. The author believes that they have an etiologic significance, playing a part in the endogenous as well as ectogenous infections, in the latter so far as bacilli originating in a healthy subject, or bacilli that have become degenerated in the course of a nutritional disturbance, become a source of infection for other healthy children. By repeated vaccination in culture mediums, paracolon strains could be turned into ordinary colon bacilli, and this makes it appear probable that such a transformation takes place also in the intestine, when after a cure the paracolon bacilli disappear from the feces. On the other hand, it was possible to detect by the culture method a transformation of colon bacilli into paracolon bacilli, which again indicates the possibility of such a mutation in the intestine. Moreover, it appears not only that relations exist between the paracolon group and the colon group but that there is also a relation to the paratyphoid group. The author observed that the paracolon strains from severe enteral disturbances as a rule keep their cultural characteristics longer than do those from the milder disorders or from carriers. The toxic action of the paracolon bacilli was determined by testing the culture filtrates on rabbits, either by intracutaneous injection or by introduction into the intestine. It was found that in the intracutaneous tests the bacterial disturbances have a pronounced effect, causing not only local but also general reactions. Filtrates of the paracolon strains from normal children produced either no reactions or only slight ones. The toxicity of the filtrates seemed to increase with the duration of the incubation. Intracutaneous tests on guinea-pigs proved that on the whole the reaction was the more severe, the more severe had been the intestinal disorder. The toxicity was frequently reduced when the paracolon strain had lost its cultural characteristics, but often the same, when the original strain had kept its cultural properties. Tests on the surviving intestine of rabbits disclosed that filtrates of paracolon strains originating in bacillus carriers had no effect whatever. Filtrates from ordinary colon bacilli (some originating from toxic intestinal disturbances) likewise produced no reaction. Paracolon filtrates from severe enteral disturbances always had a toxic effect on the surviving intestine, for they produced an irritation in low concentration, while they produced paralysis in high concentration.

Demonstration of Tubercle Bacilli in Blood.—Repeated studies on the demonstration of tubercle bacilli in the blood revealed to Busson that, in spite of identical experimental factors, the development of colonies of tubercle bacilli may differ greatly. This is at least one of the contributing causes of the great differences in the results of tests for tubercle bacilli in the blood. He concludes that either the egg culture medium (Löwenstein) is not as suitable for the cultivation of the tubercle bacillus as has been believed, at least in certain cases, or that there are certain strains of tubercle bacilli which are extremely easily impaired, so that under certain conditions a suspension in a sodium chloride solution or a passage through the blood stream could damage them. That such differences exist between the various strains is indicated by the fact that cultures of tubercle bacilli from the sputum or from exudates are usually easily obtained by means of the egg culture medium, while cultivation from the blood frequently reveals considerable differences in the growth of certain strains on the several tubes. The author is unable to say whether this is due to the presence in the blood of substances that have a damaging effect on the bacilli or to other causes. At any rate this possibility has induced him to employ the hemolysis by means of saponin, a method that is the least damaging to the bacilli.

Vomiting of Blood in Tumors of Liver.—Beer describes two cases of hematemesis which he considers worthy of note because they had a pathogenesis that has so far been given little attention. The cases show that hematemesis may result from a compression of the portal vein by a tumor. The hematemesis was caused in both patients by varicose veins on the esophagus, which in turn had resulted from stasis in the portal vein. The first case proves that, with the exception of the ascites, all other symptoms of stasis of the portal vein may be absent. The author ascribes to the incompleteness of the closure of the portal vein or to the short duration of the closure the fact that neither of the patients had a tumor of the spleen. He points out that this seems to be characteristic of the cases in which the stasis is produced by cancer, but he admits that further observations will be necessary to corroborate it. The hematemesis in the terminal stage of the disorder in the first patient may have been caused also by the peptic digestive changes in the esophagus, which result from cachexia and atony.

Hospitalstidende, Copenhagen

77: 749-792 (June 26) 1934

*Radiculomeningomyelitis: Two Clinical Lectures. V. Christiansen.—p. 749.
Fracture of Styloid Process of Radius Unsuccessfully Treated: Healing by Means of Prolonged Immobilization. O. Kapel.—p. 786.

Radiculomeningomyelitis.—Christiansen states that this disease manifests itself in a spinal type, a cerebral type and a third form representing a combination of successions of the other two, and he describes nine cases. The disturbance is characterized by its acute onset, the rapidity with which the symptoms develop, its grave acme and its rapid recovery. In the spinal type, after a short but not constant preliminary stage, with capriciously scattered paresthesias, paralyses occur of varying extent and varying intensity and kind, usually as paraplegias or quadriplegias, sometimes with hemiplegic or monoplegic distribution; they may be atonic or spastic. Sensory deficiency symptoms are noted, and often difficulty in urination. In all cases there are changes in the spinal index. In the cerebral type the basal nerves, together with vestibular and cerebellar symptoms, dominate the picture. Only three disorders may present differential diagnostic difficulties, namely, cerebrospinal syphilis, in which the biologic examination of serum and spinal fluid are decisive, the milder form of polyneuritis, and compression of the spinal cord or of the nervous organs at the base of the brain.

Norsk Magasin for Lagevidenskapen, Oslo

95: 785-904 (July) 1934

Tumors Originating from Craniopharyngeal Canal and Related Tumors: ("Chordonas"). F. Harbitz.—p. 785.
*Hematoporphyria: Brief Review in Connection with Clinical Contribution. R. Opsahl.—p. 813.
Lactic Acid Production in Dynamic and Static Muscular Activity. O. Jervell.—p. 835.
Subcutaneous Lesions of Hepatoduodenal Ligament and Biliary Ducts. P. Treider.—p. 842.

Hematoporphyria.—Opsahl demonstrated a disturbance of the liver in a case of acute hematoporphyria which otherwise completely corresponded to the form known as idiopathic. Anatomopathologic examination showed microscopically the typical picture of chronic hepatitis with beginning cirrhosis of the liver. The case thus supports the conception that the liver plays an important part in the pathogenesis of hematoporphyria.